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APPENDIX

RECLAMATION AND DEVELOPMENT GRANTS PROGRAM

APPENDIX TO REPORT TO THE LEGISLATURE
JANUARY 1993

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RECLAMATION AND DEVELOPMENT GRANTS PROGRAM

APPENDIX TO REPORT TO THE LEGISLATURE

Project Evaluations and Recommendations

January 1993

Montana Department of Natural
Resources and Conservation
Conservation and Resource Development Division
1520 East Sixth Avenue
Helena, Montana 59620-2301
Phone (406) 444-6668

RECLAMATION AND DEVELOPMENT GRANTS PROGRAM
Project Recommendations
Fiscal Years 1994-95

Rank/Applicant	Project Name	Recommended Funding	Accumulative Funding
1 BOARD OF OIL & GAS CONSERVATION	Kevin-Sunburst Plugging & Reclamation Project	$299,000	$299,000
2 BOARD OF OIL & GAS CONSERVATION	Cat Creek Plugging & Reclamation Project	$214,810	$513,810
3 GOVERNOR/LT. GOVERNOR'S OFFICES	The Montana Office of Public Policy Dispute Resolution	$127,667	$641,477
4 TOWN OF WALKERVILLE	Walkerville Reclamation Project	$75,569	$717,046
5 DEPT. OF STATE LANDS	Well Assessment and Abandonment--Oil and Gas	$211,800	$928,846
6 BROADWATER CONSERVATION DISTRICT	Whites Gulch Placer Mine Reclamation Project	$296,300	$1,225,146
7 TOOLE COUNTY	North Toole County Oil Field Reclamation Project	$298,284	$1,523,430
8 DEPT. OF FISH, WILDLIFE AND PARKS	Elk Creek Placer-Mined Channel Reconstruction	$72,850	$1,596,280
9 TOWNS OF COLUMBUS AND JOLIET	Waste Stream Reduction--Oil Recycling	$41,172	$1,637,452
10 MONTANA SALINITY CONTROL ASSOCIATION	Soil and Water Nonpoint Source Pollution Control	$172,250	$1,809,702
11 CARBON COUNTY CONSERVATION DISTRICT	RC&Ds Affecting Change Through Local Leadership	$300,000	$2,109,702
12 DEPT. OF HEALTH AND ENVIRONMENTAL SCIENCES	Nonpoint Source Pollution Control in Montana	$300,000	$2,409,702
13 BUREAU OF MINES AND GEOLOGY	Acid Mine Drainage-Stockett/Sand Coulee Area	$148,623	$2,558,325
14 JEFFERSON VALLEY CONSERVATION DISTRICT	Crystal Mine Remediation Technology Demonstration	$150,000	$2,708,325
15 DEER LODGE VALLEY CONSERVATION DISTRICT	Developing Acid/Heavy Metal-Tolerant Cultivars	$137,700	$2,846,025
16 GLACIER COUNTY CONSERVATION DISTRICT	Evaluation of Groundwater Contamination, Red River	$214,059	$3,060,084
17 VALLEY COUNTY	Fort Peck Reservoir Breakwater	$300,000	$3,360,084
18 DEPT. OF NATURAL RESOURCES AND CONSERVATION	Arsenic Transport & Mobility	$50,000	$3,410,084
19 RAVALLI COUNTY	A Lake for Better Water Quality (Como Lake Dam Rehab.)	$300,000	$3,710,084
20 BUTTE-SILVER BOW	Mitigation of Mining and Smelting Damage--Urban Forestry	$150,000	$3,860,084
21 TOWN OF HOT SPRINGS	Camas Therapy Center	$150,000	$4,010,084
BUTTE-SILVER BOW	Development of a Mine Subsidence Insurance Program	$0	$4,010,084
CROW TRIBE	Lodge Grass School--Coal Mine and Gravel Pit Reclamation	$0	$4,010,084
GALLATIN COUNTY ROAD AND BRIDGE DEPT.	West Gallatin River-Flood Control	$0	$4,010,084
MONTANA DEPT. OF STATE LANDS	Expansion of the Geographic Information System	$0	$4,010,084
MONTANA STATE UNIVERSITY/PLACES	Soil Moisture Modeling in Reclaimed Landscapes	$0	$4,010,084
PONDERA COUNTY CONSERVATION DISTRICT	Lake Francis Shoreline Rehabilitation Project	$0	$4,010,084
RICHLAND COUNTY CONSERVATION DISTRICT	Water Development and Management (Neutron Probe)	$0	$4,010,084
SHERIDAN COUNTY CONSERVATION DISTRICT	Extent of Oil Field Waste Contamination	$0	$4,010,084

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APPENDIX TO RECLAMATION AND DEVELOPMENT GRANTS PROGRAM

REPORT TO THE LEGISLATURE

PROJECT EVALUATIONS AND RECOMMENDATIONS

These evaluations are based on the Department of Natural Resources and Conservation's review of the projects. The evaluations are presented in the order of their ranking. To find any particular evaluation quickly, just consult the Table of Contents at the beginning of this appendix for an alphabetical listing by the names of the applicants.

- 1 -

APPLICANT NAME : Montana Board of Oil and Gas Conservation

PROJECT/ACTIVITY NAME : Kevin-Sunburst Plugging and Reclamation Project

AMOUNT REQUESTED : $ 299,000

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor $ 5,300

TOTAL PROJECT COST : $ 304,300

PROJECT ABSTRACT (Prepared and submitted by applicant)

The purpose of this grant request is to provide funding to properly plug and perform surface reclamation of twenty-six oil or gas test wells in the Kevin-Sunburst Field and adjacent areas within Toole and Liberty Counties. These wells were drilled prior to the existence of the Board of Oil and Gas Conservation's regulatory program. All of the unplugged wells in this application have the potential to create surface damage and groundwater contamination, and the surface disturbance associated with many of the sites impedes or prevents the land use common to the areas adjacent to the sites.

TECHNICAL ASSESSMENT (Prepared by DNRC)

This application involves plugging and restoration of twenty-five well locations in Toole County and one well in Liberty County. Included in the list are several open holes containing a fluid column, wells from which gas is venting to the atmosphere, and numerous unplugged wells with little or no information available concerning current down-hole condition.

In order to protect groundwater and surface water, stop well flow, if any, and isolate subsurface porous intervals, the Board of Oil and Gas Conservation (BOGC) proposes to re-enter each well bore, stabilize the well's hydrostatic condition, and plug the well with cement or cement and mechanical plugs. Any junk or debris associated with the locations would be properly disposed of, and the well sites would be leveled, returned to natural contour, and re-vegetated.

The work would be performed by qualified contractors, and BOGC would provide on-site supervision by its own staff members. Special engineering or supervisory services may be required for the more difficult or complex wells.

This project addresses a statewide need to reduce the potential adverse impacts of improperly abandoned wells on the water resources, land use, and mineral values of the state. The project reflects the ongoing concern for potential point source degradation of groundwater.

Unfortunately, in many instances BOGC's well records do not reflect accurate well information or methods of plugging (if any plugging was attempted) for wells drilled before BOGC was established in 1954. BOGC should be commended for electing to pursue an ongoing project of seeking out such problem wells and has received previous DNRC contracted services money to perform the initial records examination and develop an inspection list for the purpose of physically locating and reviewing each of these old wells. The proposed project includes wells that were found as a result of field inspections made using the list prepared under a BOGC/DNRC contract.

The proposed project and the wells to be plugged are similar in nature to those other projects that have been successfully completed. It is BOGC's intention to continue to plug, reclaim, and otherwise mitigate damage caused by oil and gas development for which no responsible party can be found. Of the two grant applications submitted by BOGC this cycle, this proposal is of higher priority.

FINANCIAL ASSESSMENT

Generally, those wells that have visible surface casing, are not located in a wet area created by well flows, and have reasonably reliable well information on casing size,

weight, grade, and setting depths are estimated as the least costly to plug. Plugging wells where little is known about the well-bore configuration is estimated at a substantially higher cost by BOGC staff because a worst-case for well conditions would be assumed by drilling contractors bidding on these types of projects.

Although it is reasonable to anticipate that all of the included wells could be plugged for the amount requested in this grant application, there is the potential for cost overruns on one or more wells due to mechanical problems that become apparent only after a well is re-entered. Such circumstances could limit the total number of wells that could be plugged and restored for a fixed amount of money. Therefore, the activities at each well site would be undertaken as an individual project, and the balance of money remaining at the finish of that project would be available for the next well on the priority list. This progression would continue until all wells are plugged or the grant monies are exhausted.

The costs of plugging are based on the estimated time to plug, the cost of plugging materials, and the cost of dirt work done in preparation for re-entry of the well and restoration of the location upon completion of the project. Costs of third-party services, including trucking of water and materials, logging or other wire line services, and renting specialized equipment such as fishing tools, are also included in the estimate.

Well plugging projects would normally be undertaken in the order listed in the application. Some flexibility to change priorities is needed, however, because well-bore conditions can change dramatically. In some instances it may be necessary to substitute a newly discovered problem well in lieu of or ahead of a well already on the project list. This change in priority may be indicated by the potential for surface water or groundwater damage; wells would be prioritized based upon the estimated severity of damage likely to occur if the well is left un-plugged. Therefore, in some cases cost estimates may prove inaccurate by the time the well work is scheduled. In short, there is no guarantee that all of the wells listed can be plugged for a cost at or under the maximum requested funding.

The total estimated cost of $304,300 is reasonable for the type of work to be performed.

ENVIRONMENTAL EVALUATION

The proposed project would include remediation and cleanup efforts at twenty-six well sites within the Kevin-Sunburst Field. Activities at the sites would require disturbance to enter and plug the wells and to reclaim each location. These adverse impacts would be short-term, depending on whether the methods and procedures used reflect conditions present at each site. For example, the extent of soil contamination from oil at each site is unclear. Cleanup measures should address whether removal of contaminated soil would be necessary in order to ensure revegetation success and eliminate surface water and groundwater pollution sources at the site. The project should result in long term beneficial impacts at these sites if reclamation is successful.

As a condition of funding if this project is approved, DNRC would require a more detailed description of the measures and, if necessary, a reclamation plan for each site. The information should address the method for and level of desired surface cleanup and reclamation to be achieved at each site.

PUBLIC BENEFITS ASSESSMENT

The greatest public benefit to be achieved would be the elimination of potentially severe groundwater and surface water contamination by non-potable or lower quality water and hydrocarbons from deeper formations. In some cases potentially commercial mineral-bearing zones (including oil and gas zones) may be protected from damage by extraneous water and hydrocarbons. Systematic cleanup and proper plugging of abandoned oil and gas wells would benefit not only the environment, but all Montanans.

RECOMMENDATIONS

A grant of up to $299,000 is recommended for this project, contingent upon DNRC approval of the project scope of work and budget.

APPLICANT NAME : Montana Board of Oil and Gas Conservation

PROJECT/ACTIVITY NAME : Cat Creek Plugging and Reclamation Project

AMOUNT REQUESTED : $ 214,810

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor $ 2,000

TOTAL PROJECT COST : $ 216,810

PROJECT ABSTRACT (Prepared and submitted by applicant)

The purpose of this grant request is to provide funding to properly plug and perform surface reclamation of three oil test wells in the Cat Creek Field area of Petroleum County, and to reclaim the location of an adjacent plugged oil well. These wells were drilled prior to the existence of the Board of Oil and Gas Conservation's regulatory

program. All of the existing unplugged wells have the potential to create surface damage and substantial groundwater contamination.

TECHNICAL ASSESSMENT (Prepared by DNRC)

The wells and locations included in this application are in or near the floodplain of the Musselshell River in Petroleum County. One well is allowing water and a small amount of oil to reach the surface very close to the river channel. The second well, located within a hay meadow, is leaking a small amount of oil to the surface. The third well has no obvious surface contamination; however, the subsurface conditions may pose problems.

In order to protect groundwater and surface water, stop well flow, and isolate subsurface porous intervals in the three wells, the Board of Oil and Gas Conservation (BOGC) proposes to re-enter each well bore, stabilize the well's hydrostatic condition, and plug the well with cement or cement and mechanical plugs. Such techniques are standard.

Any junk or debris associated with the locations would be properly disposed of, and the well sites would be leveled, returned to natural contour, and re-vegetated. In conjunction with the plugging and restoration project for the three well sites, a tank and miscellaneous debris would be removed from a fourth old well location, and the surface would be restored and revegetated.

The names and locations of the three wells are:

1. Charles #1 — NW¼, Sec. 21, T15N, R30E, Petroleum County
2. Jackson #1-A — NW¼, Sec. 27, T15N, R30E, Petroleum County
3. Charles #4 — NW¼, Sec. 21, T15N, R30E, Petroleum County

The fourth plugged well location is located in the NE¼ of Sec. 21, T15N, R30E.

The work would be performed by qualified contractors, and BOGC would provide on-site supervision by its own staff members. Special engineering or supervisory services may be required for the more difficult or complex wells.

This project addresses a statewide need to reduce the potential adverse impacts of improperly abandoned wells on the water resources, land use, and mineral values of the state. The project reflects the ongoing concern for potential point source degradation of groundwater.

Unfortunately, in many instances BOGC's well records do not reflect accurate well information or methods of plugging (if any plugging was attempted) for wells drilled before BOGC was established in 1954. BOGC should be commended for electing to pursue an ongoing project of seeking out such problem wells and has received a previous DNRC contracted services money to perform the initial records examination and develop an inspection list for the purpose of physically locating and reviewing old wells. The proposed project includes wells that were found as a result of field inspections made using the list prepared under a BOGC/DNRC contract.

The proposed project and the wells to be plugged are similar in nature to those other projects that have been successfully completed. It is BOGC's intention to continue to plug, reclaim, and otherwise mitigate damage caused by oil and gas development for which no responsible party can be found. Of the two grant applications submitted by BOGC this cycle, this proposal is of lesser priority.

FINANCIAL ASSESSMENT

Generally, those wells that have visible surface casing, are not located in a wet area created by well flows, and have reasonably reliable well information on casing size, weight, grade, and setting depths are estimated as the least costly to plug. Plugging wells where little is known about the well-bore configuration is estimated at a substantially higher cost by the BOGCs staff because a worst-case for well conditions would be assumed by drilling contractors bidding on these types of projects.

The costs of plugging are based on the estimated time to plug, the cost of plugging materials, and the cost of dirt work done in preparation for re-entry of the well and restoration of the location upon completion of the project. Costs of third-party services, including trucking of water and materials, logging or other wire line services, and renting specialized equipment such as fishing tools, are also included in the estimate. The costs BOGC has estimated for each individual well appear reasonable; the total cost would be $216,810.

The well-plugging projects would normally be undertaken in the order listed; however, some flexibility to change priorities is needed because well-bore conditions can change dramatically. In some instances it may be necessary to substitute a newly discovered problem well in lieu of or ahead of a well already on the project list. This change in priority may be indicated by the potential for surface water or groundwater damage; wells would be prioritized based upon the estimated severity of damage likely to occur if the well is left unplugged. Therefore, in some cases cost estimates may prove inaccurate by the time the well work is scheduled. In short, there is no guarantee that all of the wells listed can be plugged for a cost at or under the maximum requested funding.

ENVIRONMENTAL EVALUATION

The proposed project would include remediation and cleanup efforts at three oil well sites and an oil storage tank site within the Cat Creek Field. Activities at the sites would require disturbance to enter and plug the wells and to reclaim each location. These adverse impacts would be short-term, depending on whether the methods and procedures used reflect conditions present at each site. For example, the extent of soil contamination from oil at each site is unclear. Cleanup measures should address whether removal of contaminated soil would be necessary in order to ensure revegetation success and eliminate surface water and groundwater pollution sources at the site. The project should result in long-term beneficial impacts at these sites if reclamation is successful.

As a condition of funding if this project is approved, DNRC would require a more detailed description of the measures and, if necessary, a reclamation plan for each site. The information should address the method for and level of desired surface cleanup and reclamation to be achieved at each site.

PUBLIC BENEFITS ASSESSMENT

The greatest public benefit to be achieved would be the elimination of potentially severe groundwater and surface water contamination by non-potable or lower quality water and hydrocarbons from deeper formations. In some cases potentially commercial mineral-bearing zones (including oil and gas zones) may be protected from damage by extraneous water and hydrocarbons. Surface restoration and cleanup and proper plugging of abandoned oil and gas wells would benefit not only the environment, but all Montanans.

RECOMMENDATIONS

A grant of up to $214,810 is recommended for this project, contingent upon DNRC approval of the project scope of work and budget.

APPLICANT NAME : Governor/Lieutenant Governor's Offices

PROJECT/ACTIVITY NAME : The Montana Office of Public Policy Dispute Resolution

AMOUNT REQUESTED : $ 127,667

OTHER FUNDING SOURCES AND AMOUNTS :

National Institute for Dispute Resolution	$ 50,000
Western Governors' Association	$ 40,000

TOTAL PROJECT COST : $ 217,667

PROJECT ABSTRACT (Prepared and submitted by applicant)

The State of Montana is confronted with a variety of contentious and protracted natural resource disputes, such as allocating and managing water, balancing multiple uses of public lands, and maintaining the stability of resource-dependent communities. These disputes, which typically involve competing interests, multiple jurisdictions, and complex subject matter, are becoming more difficult to resolve in the traditional legislative, administrative, and judicial arenas.

In response to this emerging gridlock, many policymakers, government leaders, private businesses, and nongovernmental organizations are recognizing the need for more collaborative, time-saving, and cost-effective approaches to resolve these "public disputes." Although there have been some isolated experiments in Montana with the use of consensus-building processes, there is currently no institution or focal point for consensus-building and dispute resolution activities within the state.

In light of the need for such services, the Governor/Lieutenant Governor's Offices propose to establish the Montana Office of Public Policy Dispute Resolution. The purpose of the office is to help the state, upon the request of affected interests, resolve contentious natural resource issues. The office will build on existing dispute resolution efforts and promote consensus-based approaches to resolving natural resource issues. It will provide a variety of services, including consultation, training, and mediation. As a neutral forum designed to resolve complex, multi-party natural resource issues, the office will not approve or disapprove of any outcome that is reached through a consensus process facilitated by the office.

The office will be a two-year pilot project that will focus on natural resource agencies and issues. After the two-year pilot project, the office will begin to address the full range of contentious public policy issues in the state. The office will be staffed by an executive director and governed by a broad-based, public/private advisory council appointed by the Governor/Lieutenant Governor.

The office will also participate in a larger effort, initiated by Governor Stan Stephens and Governor George Sinner, to create a regional program for dispute resolution and consensus building. The States of Montana, North Dakota, South Dakota, Wyoming, and Idaho and the Provinces of Alberta, Saskatchewan, and Manitoba are currently working with the National Institute for Dispute Resolution (NIDR) and the Western Governors' Association (WGA) to create this regional program. NIDR has already committed $50,000 to the regional program, while WGA is expected to commit another $40,000 by fall of 1992.

The ultimate objective of both the Montana office and the regional initiative is to evolve into a public/private, nonprofit corporation. This objective is designed to maintain the long-term credibility of the office and to reduce its dependence on state government.

TECHNICAL ASSESSMENT (Prepared by DNRC)

Montanans are interested in protecting the environmental quality of the state; however, the livelihoods of many Montanans are dependent on traditional resource industries--mining, oil and gas, grazing, logging, and agriculture. A polarization of people on both sides of issues emerges from attempts to sustain both the economy and the environment. The consequence, which is partly fueled by the contrast between urban and rural values, is a fierce and widening battle over the appropriate use of the state's natural resources. The ongoing debates over wilderness protection, logging quotas, instream flow protection, water quality protection, reintroduction of wolves, and bison management reflect the range and intensity of disputes over natural resources.

Formal mechanisms for dispute resolution--legislative, administrative, and judicial--are increasingly unable to provide satisfactory resolutions to these issues. As a consequence, trust and confidence in government are eroding, community relations are strained, economic and ecological values are threatened, and mutually acceptable management solutions remain unidentified and unimplemented. The use of consensus-building approaches can be achieved by working to improve relationships among interest groups and government, enhancing the flow of information about policies and problems, creating opportunities for involvement in governmental processes, improving communications, mediating specific disputes, and training in negotiation and conflict resolution. A focal point for collaboration, discussion, and information would be very valuable.

Worth pointing out, however, is the program's association with the Governor/Lieutenant Governor's Offices. No doubt this would benefit the program by giving it higher visibility

and greater access to governmental agencies. However, to actually mediate disputes, the mediator must be perceived by the involved parties as neutral and impartial. For many larger public policy disputes in the state, a mediator attached to the Governor/Lieutenant Governor's Offices would not be acceptable to all parties. There is also danger that the program (and thus the mediation process) would be seen by people as just another area of state government to have to contend with, instead of being allowed to make decisions for themselves.

These concerns could be offset by clarifying the function of the office. The strength of this office would be in educating, exchanging information, and acting as a catalyst for using alternative dispute resolution. Actual mediation of disputes would likely be limited to smaller disputes, local issues, instances where mainly governmental agencies are involved, and cases where the parties do not perceive that the state has an interest in the outcome of the dispute. Clarification of the functions of the office would assist in accomplishing its goals and avoiding misconceptions and false expectations.

FINANCIAL ASSESSMENT

The two-year RDGP budget of $127,667 is broken into the following categories:

Salaries, wages, fringe (executive director)	$ 108,420
Contracted services (training)	$ 2,400
Supplies and materials	$ 1,500
Communications	$ 2,760
Travel (director and council)	$ 10,587
Miscellaneous	$ 2,000
TOTAL	$ 127,667

The office would charge fees for many of its services and would attempt to raise non-state funds for its continuation after the initial two-year period. Compared to other regional dispute offices, the salary figures are reasonable for the work to be performed.

ENVIRONMENTAL EVALUATION

The creation and operation of the Office of Public Policy Dispute Resolution would not directly impact the environment. Any environmental effects, either beneficial or adverse, would result indirectly or cumulatively as a result of actions taken to develop resources in accordance with mediation outcomes.

PUBLIC BENEFITS ASSESSMENT

The use of collaborative, consensus-building approaches to resolve natural resource issues would provide a variety of benefits to the public. Consensus building requires voluntary, informal, face-to-face interaction among all affected interests. The

participants design the dispute resolution process, jointly define problems, and seek "mutual gain" rather than "win-lose" solutions. They develop ownership to both the process and its outcome, and thereby have a vested interest in implementation.

Alternative, consensus-building approaches are designed to supplement, not replace, existing decision-making and dispute resolution processes. The goal is to create a comprehensive decision-making system with complementary dispute resolution methods. This approach to resolving natural resource and other "public disputes" in Montana may lead to more viable agreements, increase public participation in decision-making, improve community relations, and improve trust and confidence in government.

RECOMMENDATION

A grant of up to $127,667 is recommended for this project, contingent upon DNRC approval of the project scope of work and budget.

- 4 -

APPLICANT NAME : Town of Walkerville

PROJECT/ACTIVITY NAME : Walkerville Reclamation Project

AMOUNT REQUESTED : $ 75,569

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor	$ 2,500
ARCO	$ 6,900
New Butte Mining	$ 6,900
Butte-Silver Bow Government	$ 6,900

TOTAL PROJECT COST : $ 98,769

PROJECT ABSTRACT (Prepared and submitted by applicant)

From 1881 until 1959, the area around the Town of Walkerville was the site of virtually continuous mining and milling activity. The Alice Mine was primarily mined for silver, and the amalgamation process utilized large amounts of mercury. The waste materials from the mining, milling, and amalgamation processes were consolidated in dump areas, which are found throughout the community.

The Walkerville Ball Field was created in the late 1930s as a recreational facility for the community's children. The ball field was constructed by leveling off a section of the waste dumps. The facility was used by the residents through 1986.

In March 1986, soil sampling of the Walkerville Ball Field by the Montana Bureau of Mines and Geology indicated the following elevated levels of metals: 107 parts per million (ppm) cadmium, 11,000 ppm lead, and 2,500 ppm mercury at a depth of 1.5 to 1.8 feet. Free elemental mercury was evident at this depth. Because of the elevated levels of heavy metals, the EPA conducted the 1988 Walkerville Time-Critical Removal Action. The Atlantic Richfield Company (ARCO), a potentially responsible party for this action, consolidated contaminated material from several areas in Walkerville at the ball field site. The entire area was capped, vegetated, and fenced. This cap precludes public use of the area.

The Walkerville Ball Field had been used continuously by the citizens of Walkerville for over 50 years. Since 1988, the children of Walkerville have had no place that is close to their homes to play softball. Softball is a major spring and summer activity throughout Butte and Walkerville. Leagues and teams exist throughout the city for people of all ages from "T-Ball" to "Old Ozzies and Old Dollies." The fields throughout the community of Butte are used continuously all summer. It is also not unusual to see "pick-up" games in any vacant area.

The Town of Walkerville was given a grant deed from New Butte Mining for a site to construct a new baseball field. This was as a result of the direct action of mining activity. The former ball field was a smelter site. New Butte Mining as a major property owner in Walkerville determined that it would give the city the land to replace the ball field. A partnership of all parties involved resulted in the deed of land, and money for paving the road came from ARCO and Butte-Silver Bow. The Job Corps has participated as well, providing assistance with leveling and site preparation.

The money requested from the Reclamation and Development Grant Program (RDGP) is for the following items:

1. Construct a fence, backstop, dugouts, mound, parking lot, and playground
2. Landscape
3. Install a sprinkler system
4. Construct a water line to the baseball field
5. Construct a power line for the facility

The new ball field will be located at the west end of Walkerville, north and east of Ryan Road. It will occupy an area of 160,000 square feet and will take four months to complete once the grant has been received.

The Walkerville Softball Field Project is an excellent example of public/private partnership. Private companies and various local, state, and federal agencies have contributed to the completion of this project. It will provide an opportunity for the youth of the community to play in a safe environment. Walkerville has seen a marked increase in the number of young people in recent years. This facility will allow the people of this community a unique opportunity to enjoy America's favorite sport once more.

TECHNICAL ASSESSMENT (Prepared by DNRC)

Recent reclamation of mining wastes in Walkerville has improved the environmental quality of the area, but eliminated its recreational opportunities. There are no current plans by EPA to replace the former ball field. This project would mitigate destruction of the town's former ball field facility by constructing a new facility at an environmentally safe location. Soils at the proposed site have been sampled for elevated levels of heavy metals and are below EPA action levels. The reclamation proposed would help to improve and protect the health of area youth and the environment and further RDGP's goal of mitigating damage to public resources caused by mineral development. Funding of this project would complete the reclamation process.

RIT funding would allow completion of the Walkerville Baseball Field by the end of 1993, thus, replacing the area's single most important recreational facility approximately five years after its removal. It would also fulfill the efforts of the citizens of Walkerville and private industry to replace the community's ball park with a new and environmentally safe recreational facility for the entire Butte-Silver Bow area, in which demand for existing facilities in Butte is already at a very high level.

Without funding from the RIT grant, further delays in the completion of the proposed baseball field would be realized by the citizens of Walkerville, which may potentially erode the accomplishments of the project's efforts to date. Site preparation by the Anaconda Job Corps will be completed during the summer of 1992, allowing construction of the facility to begin during the construction season of 1993. However, completion of the project would remain in doubt, and frustration of the citizens of Walkerville would continue to grow unless additional funding of the proposed Walkerville baseball facility could be obtained.

FINANCIAL ASSESSMENT

RDGP funds are requested for the following:

Fence, backstop, dugout	$ 10,626
Water line	$ 2,792
Power line	$ 2,000
Sprinkler system	$ 12,500
Sod	$ 32,166
Playground equipment	$ 7,985
Parking lot	$ 7,500
TOTAL	$ 75,569

New Butte Mining, ARCO, and Butte-Silver Bow have contributed $20,700 for road paving; Walkerville is donating $2,500 for engineering design work.

The proposed costs of building a new baseball facility and playground area in Walkerville are within the anticipated range of costs for a project of this size and design. The total costs of the project have been minimized because of donations by private industry and community organizations. Site preparation in advance of construction of the facility has been provided at no cost to the project by the Anaconda Job Corps. The grant requested to complete construction of the facility is reasonable in the context of the proposed design of the facility. Adequate funding is requested to accomplish the tasks necessary to complete the proposed baseball field. Although Walkerville is a community of approximately 600 persons, the ball park would benefit a broad population base incorporating the Butte-Silver Bow area.

Approximately 42.5 percent ($32,166) of the estimated RDGP costs are attributed to purchasing and installing sod. It is recommended that the costs and effectiveness of seeding versus those of installation of sod be analyzed in order to determine if similar results could be achieved at less cost. A dry turf seed mix would cost approximately $2.20 per pound, and coverage criteria would require approximately 100 to 200 pounds of seed per project acre. The proposed Walkerville baseball field and playground would involve approximately 2.5 acres; thus, the costs to the project for grass seed would be approximately $1,100. Obviously, other costs associated with seeding should be included in the analysis before a fair comparison can be achieved.

ENVIRONMENTAL EVALUATION

The construction of the Walkerville Baseball Field would not produce an adverse environmental impact to the Walkerville area. As designed, the proposed ball park should alleviate existing environmental concerns by providing effective dust control, remediating an exploration trench and exploration pits identified on site, controlling

growth of noxious weeds, alleviating unlawful dumping practices currently observed at the site, and controlling erosion of soil through development of a good turf coverage and a newly surfaced parking facility.

Land development, such as paving the access road and parking area, will likely increase the volume of storm runoff from portions of the site during local storm events. Adequate routing of surface water flow from parking areas and roadways should be implemented in the design and construction of the facility to minimize the impact of erosion downgradient from the field.

The proposed site was chosen because it is not considered a former mining site, and the disposal of mining wastes has apparently not occurred at the site during the history of mining development in the Walkerville area. New Butte Mining has indicated that ore is not present in the subsurface beneath the site; thus, natural background levels of heavy metals are thought to occur throughout the topsoil at the site. Analysis of soil samples collected at the site confirms that levels of lead are low in the topsoil. Furthermore, the development of a layer of turf at the site should provide adequate stability and a buffer of protection from other metals potentially contained in the topsoil at the site.

Short-term environmental impacts may be realized during site preparation and actual construction of the ball park. Emission of dust particulates may increase during construction activities, prior to the development of a cover of grass. Dust control techniques should be implemented during excavation and grading of the site such as spraying water on affected areas. Runoff control to minimize erosion should also be considered and implemented during construction operations.

PUBLIC BENEFITS ASSESSMENT

Designed to mitigate damage to public resources caused by mining, this project would provide an environmentally safe and well-designed area for the citizens of Walkerville and Butte-Silver Bow to recreate. Fencing the facility would supply added safety. Funding of the project would allow completion of the Walkerville Reclamation Project, which has already involved great time and expense from the people and organizations in the Walkerville and Butte-Silver Bow area.

Local support and planning are well documented through the efforts of the Walkerville mayor, Walkerville Baseball Committee, citizens of Walkerville, Anaconda Job Corps, and Butte-Silver Bow officials. Private industry's involvement and support are also evident through donations to the proposed facility by ARCO and New Butte Mining. State and federal support and planning are shown through efforts to verify that the levels of metals in soils at the proposed site are below current residential action levels, and through provision of a site inspection of the proposed field location during the site selection process.

RECOMMENDATION

A grant of up to $75,569 is recommended for this project, contingent upon DNRC approval of project scope of work and budget.

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APPLICANT NAME : Montana Department of State Lands (DSL)

PROJECT/ACTIVITY NAME : Well Assessment and Abandonment-Oil and Gas

AMOUNT REQUESTED : $ 211,800

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor $ 6,089

TOTAL PROJECT COST : $ 217,889

PROJECT ABSTRACT (Prepared and submitted by applicant)

The well assessment project will be conducted in Section 36 of Township 35 North, Range 2 West. This tract of land is located 1 mile east of the Town of Oilmont. Currently, several wells are emitting hydrogen sulfide gas. A common scene near the wells is to find a ring of native animals that have perished as a result of the gas. This gas poses a threat to domestic livestock, as well as human life. Additionally, the wells in this section and within Toole County have corrosion problems. This means that the casing is deteriorated and will allow commingling of water with the producing zones and vice versa. Montana statute requires the prevention of this commingling and preventing the contamination of aquifers as well as preventing the contamination of oil and gas zones. The project is intended to plug these problem wells. The project can be completed in three months' time.

TECHNICAL ASSESSMENT (Prepared by DNRC)

Completion of this project would allow the Department of State Lands (DSL) to assess the condition of existing well bores in Section 36 (which is state-owned), properly abandon those wells that are in unsatisfactory condition (because of leaks, corrosion, defective casing, etc.) or no longer producible, and cap those wells that are capable of future production. MCA 82-11-123 requires preventing the escape of oil and/or gas from one stratum into another and preventing the intrusion of water into oil and/or gas strata. The law also requires restoration of the surface to its previous grade and productive capability after a well is plugged and necessary measures to prevent adverse

hydrogeological effects from such well or hole. The requirements of MCA 82-11-123 would be satisfied if hole-specific conditions and associated impacts (past or potential) are assessed and the project results in the permanent remedy of each impact. Depending on the severity and extent of contamination, soil and water analyses may be required.

DSL has furnished a legal opinion concluding that the State of Montana is potentially liable for defective operation of its oil and gas leases and that the responsible oil and gas operator (due to bankruptcy) is very unlikely to have assets necessary to plug the wells. DSL needs to pursue this matter thoroughly and take whatever measures are necessary and provided by law to recover any RDGP funds expended for this project.

FINANCIAL ASSESSMENT

The budget is reasonable and well documented for this type of project. The actual cost will be determined during the bid process. Unknown or unforeseeable hole conditions on a particular well hole may increase plugging costs and result in fewer holes actually being plugged. The funds will be used as follows:

Contract engineer/site inspector	$ 18,200
Plugging contractor	$ 126,500
Supplies and materials	$ 49,500
Contingency	$ 17,600
TOTAL	$ 211,800

DSL is contributing $6,089 for project coordination and oversight. DSL indicates that no funds for plugging are available to it other than from RDGP.

ENVIRONMENTAL EVALUATION

The proposed project would include remediation and cleanup efforts at twenty-six gas or oil well sites within the Kevin-Sunburst Field. Activities at the sites would require disturbance to enter and plug the wells and to reclaim each location. These adverse impacts would be short-term, depending on whether the methods and procedures used reflect conditions present at each site. For example, the extent of soil contamination from oil or gas at each site is unknown presently and could affect the success of reclamation by limiting the degree of revegetation possible. Cleanup measures should address whether removal of contaminated soil would be necessary in order to ensure revegetation success and eliminate surface water and groundwater pollution sources at these sites. The project should result in long-term beneficial impacts at these sites if reclamation is successful.

As a condition of funding if this project is approved, DNRC would require a more detailed description of the measures and, if necessary, a reclamation plan for each site.

The information should address the method for and level of desired surface cleanup and reclamation to be achieved at each site.

PUBLIC BENEFITS ASSESSMENT

In addition to improving the soil, air, and water resources, successful completion of this project would improve agriculture and oil production on state-owned lands. This would be of significant benefit to the school trust fund. Potential state liability may also be reduced.

RECOMMENDATIONS

A grant of up to $211,800 is recommended for this project, subject to the following contingencies.

1. DNRC must approve the project scope of work and budget.

2. DSL must characterize soil, water, and vegetative conditions at each well bore and develop, if necessary, site-specific plans for that well that ensure long-term, comprehensive reclamation.

3. As provided by law, DSL must diligently investigate (not less than yearly) the potential for recovering RDGP funds expended for this project from potentially responsible parties, and must submit to DNRC a report of these investigations outlining the steps taken to recover project costs. If costs are recovered for this project, DSL must reimburse DNRC the full amount, including any amount for damages or penalties, it may receive.

APPLICANT NAME : Broadwater Conservation District

PROJECT/ACTIVITY NAME : Whites Gulch Placer Mine Reclamation Project

AMOUNT REQUESTED : $ 296,300

OTHER FUNDING SOURCES AND AMOUNTS :

U.S. Forest Service	(unspecified)
DFWP	(unspecified)
Trout Unlimited (pending)	(unspecified)
EPA (pending)	(unspecified)
Total	$ 52,600

TOTAL PROJECT COST : $ 348,900

PROJECT ABSTRACT (Prepared and submitted by applicant)

Whites Gulch, a tributary of the Missouri River, flows southwest out of the Big Belt Mountains near Helena, Montana. The stream was mined in the late 1800s. Since the turn of the century, production of placer gold has been small and intermittent. In 1963, 114 acres in T10N, R2E, Sec. 15 and 16, were donated to the Forest Service and withdrawn from further mineral development. Recent studies have shown that the stream section donated contains the only known population of pure westslope cutthroat trout (WSCT) on public land in the Big Belts. (A population exists in North Gurnett Creek on private land.) The applicant proposes to reclaim and mitigate the resource damage caused by mining. The fisheries, watershed, soils, and recreational resources will benefit from this restoration.

Whites Creek was diverted to the north side of the valley during mining. The south side of the valley was excavated, and tailings were placed between the excavated area and the diverted creek. The current situation at the project site is that Whites Creek runs parallel to and to the south of the Whites Creek Road, a ridge of tailings runs adjacent to the creek, and the excavated ponds area is located approximately 100 feet below the tailings. WSCT and low densities of brook trout inhabit the stream, while high densities of brook trout inhabit the ponds. The tailings piles are eroding into both the stream and the ponds, and they also are constricting the stream channel (no floodplain). Near the lower end, a section of stream has almost worked through the tailings. The stream is about 1 vertical and 5 horizontal feet away from breaching into the ponds. It is likely that in the next 5 to 10 years a flood will cause the existing channel to breach into the

ponds. If the breaching takes place, cutthroat trout viability will be questionable due to further habitat degradation and competition with brook trout. Breaching into the ponds also will cause channel instability, an increase in sediment, leading to poor water quality, and a decrease in the quality of WSCT habitat. This proposal is designed to protect WSCT populations by preventing the stream from breaching into the settling ponds and by creating a hydrologically stable stream channel and floodplain.

Specifically the project objectives are to:

1. Refill the ponds with the (nontoxic) tailings material
2. Reclaim the site by revegetating the area
3. Fence the stream from cattle use
4. Remove brook trout from the upper drainage and place a barrier downstream to prevent brook trout from re-establishing
5. Display interpretive/educational signs to inform the public of the value of the cutthroat trout resource and the opportunity to reclaim sites like Whites Gulch
6. Improve the opportunity for recreation in the drainage

The duration of the project is two years, with monitoring for an additional five years.

TECHNICAL ASSESSMENT (Prepared by DNRC)

WSCT are listed as a species of special concern by DFWP and the Montana Chapter of the American Fisheries Society, and as a sensitive species by the Forest Service, because of their limited numbers and distribution. The project, which would reclaim approximately two miles of a stream channel, is in a conceptual stage and additional design work would be necessary. Of the alternatives considered, two best meet the objectives of both protecting the west slope cutthroat trout population and providing a hydrologically sound stream channel. One alternative would be to recontour tailing piles by filling the settling ponds and constructing a more natural floodplain. The stream would not be moved. However, without additional engineering design work, it is not possible to determine whether there would be enough spoils material to completely fill the ponds or whether much of the current stream channel would need to be moved to a lower elevation and reconstructed. The other alternative would be to reconstruct the valley bottom and stream channel. Under the second option, the tailings piles would be moved in several spots to create a series of step-down pools.

Another option would be to construct a flood flow channel beginning at the parking area just above the ponds, stabilize the existing channel where it is undercutting the tailings, replace the brook trout population in the ponds with pure strain WSCT, and provide a barrier below the affected stream reach to prevent upstream movement of brook trout. Sediment traps along the USFS road would reduce the amount of sediment reaching the stream from the road. This alternative would probably require less movement of tailings, but would leave the existing stream channel perched above the ponds.

Despite uncertainties in the project design, the applicant will conduct preliminary and detailed engineering studies that would remove the uncertainty before construction begins.

FINANCIAL ASSESSMENT

Cost estimates included in the application are preliminary, and additional engineering work needs to be done to better estimate costs. It is assumed that the benefits of protecting a population of genetically pure westslope cutthroat trout, stabilizing the stream channel, and reclamation of a mined area would exceed project costs, which are estimated to be $348,900.

Most of the project costs would be for construction ($220,000). Engineering costs are estimated to be $30,000. Salaries and wages ($65,800) would be for administration, preparation of an environmental assessment (EA), fence building, and follow-up fisheries monitoring for five years. Of the $65,800 for salaries and wages, $25,500 would be paid from the RDGP grant.

The RDGP budget consists of the following.

Salaries and wages	$ 25,500
Employee benefits	$ 6,500
Contracted services	$ 253,000
Supplies and materials	$ 6,800
Communications	$ 1,000
Travel	$ 1,500
Office supplies	$ 1,000
Miscellaneous	$ 1,000
TOTAL	$ 296,300

Specific concerns over the budget include possible overestimates of the cost of earthmoving because of the short moves involved and the unconsolidated nature of the spoils. Revegetation costs also may be high; but the application does not provide sufficient detail to determine what would be done during the revegetation phase of the project. Finally, the specific amounts of matching funds from each contributor are unknown at this time.

ENVIRONMENTAL EVALUATION

The project would adversely affect water quality during and immediately following the construction period, change existing unstable topography to landforms that are more stable, and provide a more stable stream channel. An unknown number of brook trout now inhabiting the ponds would be killed; but westslope cutthroat trout habitat would be

improved. Depending on the final design, recreational fishing opportunities would be lost in the ponds but improved in the stream. The application lists minor adverse effects on historical and archaeological sites because the tailings are considered a cultural resource of low value. Cultural resource impacts could be mitigated. Because the reclaimed area would be fenced during revegetation, there would be a minor, short-term adverse effect on grazing. However, the holders of the grazing leases have agreed to allow the area to be temporarily excluded from their allotments. If the project were funded, permit requirements of affected state and federal agencies would have to be met.

PUBLIC BENEFITS ASSESSMENT

The public would benefit from having habitat for a sensitive fish species improved. In addition, stability of tailings piles and streambanks would be improved, as would aesthetics in Whites Gulch. The project has the support of the U.S. Forest Service; the Montana Department of Fish, Wildlife and Parks; Trout Unlimited; the U.S. Environmental Protection Agency; and the Montana Placer Advisory Committee.

RECOMMENDATION

A grant of up to $296,300 is recommended for this project, subject to the following contingencies.

1. DNRC approval of the project scope of work and budget.

2. If responsible party investigations at this site lead to cost recovery of RDGP grant funds expended, then Broadwater Conservation District must reimburse DNRC for the full amount of any such costs, including damages or penalties, that it may receive.

APPLICANT NAME : Toole County

PROJECT/ACTIVITY NAME : North Toole County Oil Field Reclamation Project

AMOUNT REQUESTED : $ 298,284

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor $ 13,692

TOTAL PROJECT COST : $ 311,976

PROJECT ABSTRACT (Prepared and submitted by applicant)

In northern Toole County, extensive development of oil production facilities began in 1922. It is estimated that several thousand wells were drilled prior to 1954, when regulations for management of the Kevin-Sunburst Field became effective. Frequently, well placement was 10 wells per 40 acres over a total area of about 54,000 acres. There were no regulations at that time addressing environmentally safe methods of disposal of waste oil and brines. Therefore, these wastes were commonly dumped on the land surface. Also, as oil production decreased, the population declined, leaving many facilities abandoned. The result today is the presence of dilapidated structures and the remains of production equipment scattered over the land. Soils contaminated by past dumping of wastes remain unproductive. The condition of this oil field is a significant threat to public health, soil productivity, water quality, and economic opportunity in the area. Removal of structural debris and reclamation of impacted soils are needed.

The objectives of this ongoing project are to continue inventory and assessment of sites needing reclamation work, characterize groundwater quality in the area, and accomplish removal and burial of abandoned buildings and equipment.

To date, debris removal has been accomplished at 43 sites. Soil reclamation research has been initiated at two of the sites. Monitoring of these sites will continue, and the most effective treatments will be applied to larger areas at the new sites. Abandoned debris and structures have been removed from 9,510 acres, more or less. Monies available through a series of RIT grants have been spent on inventory and reclamation of these reclaimed sites, along with additional sites proposed for cleanup.

The North Toole County Reclamation Project is administered by a five-member board representing agricultural and oil industry interests. The reclamation procedure includes site assessment, removal and burial of structures and debris (performed by contracts

awarded through public bid), drilling of monitoring wells, and application of soil treatments, with reseeding as necessary. A final product of this project will be a reclamation planning guide that will be applicable to similar sites in Montana.

TECHNICAL ASSESSMENT (Prepared by DNRC)

The application is well documented, and the methods proposed are technically sound. Continuation of this ongoing project would result in cleanup and reclamation at 11 sites (approximately 1,990 acres). When added to the 43 sites completed, cleanup would be realized on approximately 11,500 acres, or approximately 21 percent of the total 54,000 acres slated for eventual cleanup. The county expects to have the remaining affected acreage reclaimed in the next five years. To ensure project success, it is critical that the county continue coordination of project activities with the U.S. Environmental Protection Agency, Montana Department of Health and Environmental Sciences, Montana Department of State Lands, Montana Salinity Control Association, U.S. Soil Conservation Service, MSU Extension Service, Montana Board of Oil and Gas Conservation, industry, residents, and landowners. Toole County would continue to have the project designed, inspected, and implemented by private contractors, as provided by state law.

FINANCIAL ASSESSMENT

The engineering costs for this project appear high (28 percent of construction), given the nature of work and supplemental inspection performed by Toole County. Toole County would benefit by specifying in the consultant selection process exactly what design services are required and by assigning experienced personnel to the negotiation process. Any funds saved should be targeted for cleanup activities. The inspector position hired directly by the county has proven valuable in coordinating project activities with landowners, contractors, and agencies, and the position should be retained.

The RDGP budget is divided as follows:

Salaries and wages (Toole County)	$ 16,798
Contracted services	$ 242,600
Supplies and materials	$ 3,000
Communications	$ 1,200
Travel	$ 5,290
Miscellaneous	$ 2,280
Construction contingency	$ 27,116
TOTAL	$ 298,284

Toole County is providing a total of $13,692, consisting of employee benefits ($1,892), supplies ($1,000), communications ($1,200), rent and utilities ($6,600), and equipment ($3,000).

ENVIRONMENTAL EVALUATION

Several short-term impacts are envisioned in the reclamation of the 11 sites. Most notable are those that would result from heavy equipment usage (i.e., dust, noise, and soil and vegetative disruption), disposal of oil sludge material, burning of debris or other material, excavation of burial pits, disposal of contaminated soils, and saline seep reclamation. Impacts from all of these activities could be mitigated through consultation with respective regulatory authorities, incorporation of approved reclamation methods in the bid plans and specifications, and on-going inspection of cleanup progress. The expected impacts would be of short duration, provided the project is carefully designed and implemented. While complete elimination of impacts to the physical environment would not be possible, those that would result are expected to be minor to moderate.

PUBLIC BENEFITS ASSESSMENT

Public benefits would include reduced health and safety hazards; improved soil, water, and revegetation resources; and enhanced economic opportunity on reclaimed lands. A systematic, logical approach to abate the adverse impacts created by abandoned oil and gas operations benefits all Montanans.

RECOMMENDATIONS

A grant of up to $298,284 is recommended for this project, subject to the following contingencies.

1. DNRC must approve of the project scope of work and budget.

2. All cleanup must be coordinated with and approved by the Montana Department of Health and Environmental Sciences and the Board of Oil and Gas Conservation.

APPLICANT NAME : Montana Department of Fish, Wildlife and Parks (DFWP)

PROJECT/ACTIVITY NAME : Elk Creek Placer-Mined Channel Reconstruction

AMOUNT REQUESTED : $ 72,850

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor	$ 1,000
Federal Bureau of Land Management	$ 18,400

TOTAL PROJECT COST : $ 92,250

PROJECT ABSTRACT (Prepared and submitted by applicant)

Approximately 3,000 feet (in three separate reaches) of Elk Creek (T12N, R14W, Sec. 1, NE¼, PMM) does not have a channel and surface flow of water. This condition, caused by placer mining, has existed since the 1860s. These sites are the only areas on Elk Creek where there is no surface flow or channel.

Channel and riparian area rehabilitation would initiate normal function and restore the fishery on the sites, as well as improve water quality and recreational potential.

The project, as envisioned, would demonstrate how to proceed with the reclamation of placer-mined stream areas and would be a guide for rehabilitation across Montana. Reconstruction would take about 20 work days. The estimated cost is $92,250. This work would occur on U.S. Bureau of Land Management land, and BLM would do all the work except the actual reconstruction, including design, provision of construction guides, assistance in revegetation, and various aspects of monitoring and evaluation.

TECHNICAL ASSESSMENT (Prepared by DNRC)

The site is located about one mile east of Garnet. The proposed reclamation project is straightforward and basic in its approach; the work is not complicated.

The application lacks detailed specifications on the construction plan and channel design. The map provided is too general to be used as a technical tool. The success of this effort rests with the oversight personnel because of the conceptual nature of the application. However, the proposal does clearly outline the necessary steps to be taken

to achieve a good design, and the agencies involved are capable of successfully accomplishing the stated objectives. Channel reconstruction has been successfully implemented in other projects, so results are attainable and long term. A realistic estimate of the work schedule is presented.

The application describes the project as a demonstration for successful reclamation and development of "Best Management Practices for Placer Mining" by the Montana Placer Mining Advisory Committee. This aspect of the project indicates there are indirect benefits that would be far reaching. The connection of Elk Creek to the Blackfoot River, one of Montana's most sensitive rivers, increases the need and urgency of rehabilitating this tributary.

There is no discussion of the possibility of hazardous materials being in the dredge piles, which could degrade water quality when disturbed. The site is not listed on the Federal Facilities Docket as a hazardous waste site; however, the absence of hazardous materials should be documented.

FINANCIAL ASSESSMENT

The RDGP budget is presented in general detail only. The costs are based on reasonable estimates and are tied to specific tasks in the scope of work.

Contracted Services	
Construction	$ 49,500
Consultant	$ 10,000
Lab analysis	$ 7,350
Total Contracted Services	$ 66,850
Supplies and Materials	$ 6,000
TOTAL	$ 72,850

ENVIRONMENTAL EVALUATION

BLM prepared an environmental assessment (EA) on the proposed activity and found that no significant impact would result. As part of the EA, a sensitive plant survey was conducted that identified two special status plant species in the area. These plants would be avoided by the project. A cultural resource inventory also was conducted which identified two sites, one of which may be eligible for the national register. These sites are adjacent to the project and must be photographed and avoided.

If the proposed project is funded, DNRC would incorporate provisions from the federal EA into the contract and supplement them with additional provisions as necessary to comply with required state permits.

PUBLIC BENEFITS ASSESSMENT

The planned activities probably would achieve the stated objective, which is to establish "normal" stream function. This would be a useful project, providing riparian habitat and enhanced fisheries and recreation opportunities. Elk Creek is an important spawning area for the Blackfoot River. The Big Blackfoot Chapter of Trout Unlimited has ranked Elk Creek as second in funding priority for tributary streams that are in need of restoration.

By restoring streamflow to the channel, the planned activities would completely repair the damage done to the creek by past mineral development. This would be a significant improvement to the physical environment that improves the quality of public natural resources. All Montanans would benefit from the project because the benefits are certain and long-term.

Economic benefits are indirect. Successful completion of the project would demonstrate that placer mine reclamation can be accomplished at a reasonable cost. This may promote responsible future mineral development.

RECOMMENDATION

A grant of up to $72,850 is recommended for this project, contingent upon DNRC approval of the project scope of work and budget. If responsible party investigations at this site lead to cost recovery of RDGP grant funds expended, DFWP must reimburse DNRC for the full amount of any such costs, including damages or penalties, that it may receive.

APPLICANT NAME : Town of Columbus and Town of Joliet

PROJECT/ACTIVITY NAME : Waste Stream Reduction--Oil Recycling

AMOUNT REQUESTED : $ 220,084

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor	$ 7,060
Soil Conservation Service	$ 13,972
Participating Farmers	$ 4,000

TOTAL PROJECT COST : $ 245,116

PROJECT ABSTRACT (Prepared and submitted by applicant)

In this project the applicant will provide alternatives to reduce the waste stream, reduce potential water pollution, and provide a means for producing organic fertilizer from organic wastes. This material can be used as a soil amendment for lands affected by mining activity.

There are three parts to this project. Part 1 is a demonstration of bioconversion technology that produces organic fertilizer from organic waste. Four differently sized prototypes will be used to demonstrate the effectiveness from backyards to dairies and sawmills. Part 2 is a pilot waste-oil collection project. Part 3 contains a means to improve the markets for recyclables. The project will last for about 18 months.

Bioconversion of organic wastes is an alternative to landfilling, incinerating, or composting 18 percent of the waste stream. It is estimated that by 1996 all organic yard wastes will have to be removed from the waste stream. The State of Montana is rewriting its solid waste management plan at this time. Because of this update we have an opportunity to try alternative means to reduce the waste stream. Bioconversion will be shown to be an efficient, cost-effective, and environmentally safe means to recycle a valuable resource.

Waste oil needs to be recycled because of its very harmful effects on the environment. Used oil from a single oil change carelessly dumped into a waterway can ruin a million gallons of fresh water. This is the equivalent of a year's supply for 50 people.

A recycling market assistance program can assist communities and recycling businesses by providing research on potential volumes of materials, studying technological advantages, researching financial returns for equipment and personnel, and helping to carry out a long-range strategy for rural Montana communities.

TECHNICAL ASSESSMENT (Prepared by DNRC)

Waste management is becoming increasingly important to the preservation of Montana's environment. The areas of organic waste, waste oil, and recycling must be addressed before any waste management program can be successful. The concern is whether the activities proposed here are the best alternatives to manage these waste streams.

The present proposal is a follow-up to an educational and recycling effort funded by RDGP in 1991. The first phase of the project, bioconversion, is inadequately detailed. Information on the likelihood of people using this process if technically feasible, the nature and market potential of the fertilizer, the through-put rates of the bioconverters, and the reasoning as to why bioconversion is the preferred alternative over other options e.g.--composting--is needed to assess technical and financial feasibility adequately.

The second phase of the project, oil collection, seems to be a more workable program. Convenient opportunities are needed for people to dispose of this oil properly. The markets for rerefined and reprocessed oil look promising and should continue to be available for the communities' collected oil. Some initial information should be gathered to determine people's attitude and receptiveness toward the proposed handling charge of $1.25/gallon, however. (Disposal costs through the Montana Department of Administration's Procurement Division are 30¢/gallon.) Education and publicity can then be directed to overcome any negative attitudes and misconceptions before the project begins.

Regarding the third phase of the project, hiring a marketing broker/consultant, there are definite needs to fill. However, activities that are currently underway may soon fill these needs.

The Montana Environmental Information Center (MEIC) has a data base about existing recycling efforts throughout Montana. MEIC also has an information hot line for people throughout Montana to call to obtain information about where their reclaimed material can be taken.

In addition to this, MEIC in conjunction with the DNRC Energy Division and the Department of Health and Environmental Sciences' Solid and Hazardous Waste Bureau are in the process of forming a Montana Association of Community Recyclers. If successful, this association would serve many of the functions this project is trying to accomplish. These functions include documenting the successes and failures of recycling efforts in Montana, coordinating a data base about available markets, coordinating

marketing and transportation efforts among communities, providing information on available funding, networking with recycling associations in neighboring states, and perhaps serving some sort of lobbying role.

The Montana State University Extension Service performs an educational and training function. It provides educational materials and other services statewide. Also, the Extension Service is beginning to provide training about solid waste management aimed at landfill operators.

In summary, there are a number of questions to be answered before the entire project should be funded. The second phase, oil collection, however, does show promise if the potential for contamination can be controlled and negative perceptions can be overcome.

FINANCIAL ASSESSMENT

The RDGP budget, which would be administered by Beartooth RC&D, consists of the following:

Salaries and wages	$ 3,145
Benefits	$ 1,223
Contracted services (broker/consultant)	$ 61,600
Supplies and materials	$ 216
Travel	$ 4,500
Equipment	$ 105,000
Miscellaneous	$ 44,400
TOTAL	$ 220,084

The bulk of the proposed request is for phase one, bioconversion (equipment--$69,000; workshop materials--$10,000; contracted services--$60,000; plus a portion of salaries and miscellaneous costs). Given the uncertainty of public acceptance and technical feasibility of this phase, the level of expenditure is unwarranted.

Phase two should be funded as follows:

One-third of salaries and benefits	$ 1,456
Test materials (oil)	$ 216
Six oil collection centers	$ 36,000
Education, printing, and materials	$ 3,500
TOTAL	$ 41,172

No funds are recommended for phase three, recycling.

ENVIRONMENTAL EVALUATION

The oil collection phase of this project should result in direct improvement to the environment (soil, air, water, and vegetation) through elimination or reduction of indiscriminant oil disposal practices. Collection centers must be properly managed and controlled to prevent accidental spills and introduction of potentially hazardous wastes or unwanted (unmarketable) substances. If oil would be collected from other than do-it-yourselfers, then permits from the DHES Solid and Hazardous Waste Bureau may be required. The collection and transport of the oil should pose no risk to the environment if properly conducted by certified waste haulers.

PUBLIC BENEFITS ASSESSMENT

The recycling of used motor oil is an important step in the prevention of groundwater and soil contamination and the wasting of a valuable finite resource. A successful program could provide impetus for development of similar programs in other areas of Montana. The addition of more convenient drop-off locations for waste oil would enhance efforts made by the state to recycle this portion of the waste stream.

RECOMMENDATION

A grant of up to $41,172 is recommended for this project's oil recycling phase only, contingent upon DNRC approval of the project scope of work and budget.

APPLICANT NAME : Montana Salinity Control Association

PROJECT/ACTIVITY NAME : Soil and Water Nonpoint Source Pollution Control and Management

AMOUNT REQUESTED : $ 300,000

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor	$ 177,225
DNRC/CDB	$ 200,000

TOTAL PROJECT COST : $ 677,225

PROJECT ABSTRACT (Prepared and submitted by applicant)

The Montana Salinity Control Association (MSCA) is composed of three organizations representing 33 Montana counties. These sponsoring conservation districts designate an executive board to provide supervision and local input to the MSCA field staff.

Nonpoint source pollution (NPSP) prevention, reclamation, and education, along with improvement of soil, vegetation, fauna, and water quality, are the principal goals. Reclamation techniques will continue to be used to mitigate NPSP from oil and mineral exploration and extraction activities. Educational efforts focus on soil and water conservation practices that benefit the environment, agriculture, industry, fish, wildlife, and citizens of Montana, as well as those of surrounding states and Canada.

The MSCA interdisciplinary technical field team has developed a proven reclamation technique for NPSP from agricultural watersheds utilizing alternatives to summer fallow cropping. Work is completed on a watershed or site-by-site basis using local experience, labor, and dollars. MSCA uses state-of-the-art methods in hydrogeologic site characterization; recharge area identification; soil, vegetation, and water quality sampling; and monitoring. Emphasis is placed on watershed management to prevent NPSP and promote soil and water quality conservation.

Twenty-one new applications for assistance are currently on file, and 345 reclamation plans are completed. These applications reflect a variety of entities concerned about NPSP control, including the City of Havre, individual farmers, and the U.S. Fish and Wildlife Service. Additionally, a group of landowners has formed the Bullhead Water Quality Association (BWQA). BWQA has requested MSCA's technical and administrative assistance and also is actively seeking additional technical and financial support to address major NPSP problems on a 68-square-mile watershed north of Conrad. Individual site plans will be developed for 45 cooperators.

All of the above cooperators are willing to pay part of the cost to determine the sources and solutions for NPSP reclamation. New applications are continually being generated by MSCA education programs; Soil Conservation Service; conservation planning efforts; other federal, state, and private entities; and word of mouth among farmers and the public.

MSCA is dedicated to the reclamation of natural resources adversely impacted by NPSP and also to proactive conservation practices to prevent environmental degradation. MSCA proposes to offer services to conservation districts and other entities concerned about soil and water conservation throughout the state. Watershed management planning for cropland, rangeland, riparian areas, and wildlife habitat will be conducted to prevent, control, and reclaim NPSP. Recharge area identification for dryland and irrigated salinity reclamation will be a priority. Vegetation, soil, and water quality sampling; environmental assessments; and wellhead protection are a few of the services that will be provided upon request. MSCA seeks funding to initiate and complete such fieldwork and planning on 30 new sites and to provide follow-up and educational programs to current cooperators and the public at large.

MSCA has developed a unique database of shallow ground water quality, water level monitoring, and land management information. These data, along with new information

collected from funding requested here, will be provided to the Montana Ground Water Assessment and Monitoring Programs administered by the Montana Bureau of Mines and Geology.

Preventing, controlling, and reclaiming surface and ground water quality requires long-term management. Agricultural NPSP control is difficult and often requires coordinated resource management planning among several entities. Successful management must focus and coordinate resources on a watershed scale. MSCA is an existing soil and water quality management resource utilized by farmers, landowners, environmental organizations, private businesses, public schools, rural and urban communities, and federal, state, and local government agencies. A continuing education and follow-up program is an integral part of its reclamation effort. MSCA funding is also generating additional federal matching dollars for the State of Montana under Section 319 of the Clean Water Act.

TECHNICAL ASSESSMENT (Prepared by DNRC)

MSCA's methods to reduce saline seep are sound, thoroughly documented, and supported by professionals in this field. The project is well presented, and the need is convincingly documented. MSCA's efforts have been successful in publicizing the causes and costs of saline seep in Montana. Past efforts to correct the current problem are satisfactorily discussed. MSCA receives support from many other agencies and has many cooperating agencies.

Saline seep is an ongoing problem and will not be eliminated in the near future. The Triangle Conservation District (forerunner of MSCA) has been working on saline seep since 1979. Saline seep increased from more than 200,000 acres in the 1980s to 300,000 acres in the 1990s. The rate of saline seep increase is faster than MSCA can keep up with.

According to MSCA, the reclamation plan implementation rate is approximately 85 percent. The reasons this rate is not higher may be that the solution is labor-intensive, is too expensive for some farmers, and requires long-term attention to prevent future seeps. In addition, the alternative agricultural practices used in reclamation result in forage products that are not currently as marketable as the cereal grain crops generally grown in these areas.

There is some concern about MSCA's intention to expand and provide statewide assistance. According to the Soil Conservation Service, saline seep problems in the western one-third of Montana are insignificant. MSCA would most likely be working on reclamation plans dealing with nonpoint pollution caused by sedimentation, fertilizers, and pesticides. There is concern that this would duplicate efforts by the Soil Conservation Service, the MSU Extension Service, and the local conservation district's Nonpoint Source Pollution Control Program.

FINANCIAL ASSESSMENT

The average cost to develop a reclamation plan in 1989-1990 was $1,467, or an average cost of $109 per acre. The breakdown of the RDGP budget request for fiscal years 1995-1996 is listed below.

Salaries and wages	$ 110,000
Fringe benefits	$ 24,000
Contracted services	$ 4,000
Supplies and materials	$ 40,000
Communications	$ 10,000
Travel	$ 6,500
Rent and utilities	$ 7,000
Equipment	$ 64,500
Miscellaneous	$ 34,000
TOTAL	$ 300,000

Expenditures for supplies and materials include well construction materials, vehicle repairs and operations, field and planning supplies, and office supplies and repairs. Equipment expenditures include a 4x4 pickup, vehicle communication system, geographic positioning system equipment, non-nuclear moisture probe, soil sampling and analysis equipment, well construction equipment, well sampling kit, 10 water level recorders, image recorder (to make slides for computer graphics), computer hardware and software, and office furniture. Miscellaneous expenses are comprised of administration costs, professional training, educational materials (displays, tours, video, and bulletins), and insurance.

There appear to be enough funds to complete the work outlined. Reviewers commented that the salaries in this budget are high and should be more closely aligned to the state government pay scale. The state is asked to contribute 74 percent of the total budget, or 44 percent from RDGP and 30 percent from the Conservation District Bureau. According to RDGP rules, program monies are not intended to be a continuous source of funding for long-term projects or programs more appropriately funded through the state budget process (ARM 36.19.105). It is important that MSCA not continue to rely on RDGP funds and move toward becoming more self-sustaining.

MSCA has received four RDGP grants for nonpoint pollution control since 1985. Since 1988, when the first RDGP contract was written, it has spent $581,196 of the $800,000 in approved RDGP funds. As of September 1992, MSCA had $268,804 remaining to spend in currently allotted RDGP funds. MSCA's 1991 grant requires 40 percent landowner contributions; it should be noted that MSCA has been conscientious about collecting the required landowner match.

ENVIRONMENTAL EVALUATION

It is not possible to assess the direct effects of individual projects funded through this program because they are not fully known. Adverse environmental impacts are not expected to result from continuing this program. The major beneficial effects on the environment are listed below in the Public Benefits Assessment.

PUBLIC BENEFITS ASSESSMENT

This project protects and reclaims soil and water resources. Improvement of soil and water resources results from crop types and rotations that prevent soluble salts and trace minerals from being transported to the upper soil horizon, groundwater, and surface water. The perennial crop rotations also prevent erosion, which minimizes sediment movement to riparian areas. Wildlife benefit from increased forage, and aquatic life profit from improved water quality. Agricultural land is reclaimed, drinking water supplies are maintained, and infrastructures are protected.

The number of jobs created by this project is not substantial: seven people are employed by MSCA. Private landowners receive the main benefits from this program through increased production and higher returns from reclaimed lands. Statewide public benefits result from soil and water resource improvements.

RECOMMENDATION

MSCA has secured funding to carry it through Fiscal Years (FY) 1993 and 1994. The recommended amount will allow MSCA to continue its present level of operation through FY1995.

A grant of up to $172,250 is recommended contingent on the following:

1. DNRC must approve the project scope of work and budget.

2. The amount must be matched by landowner contributions of at least $68,900. This equals 40 percent of the recommended RDGP grant.

APPLICANT NAME : Carbon County Conservation District

PROJECT/ACTIVITY NAME : RC&Ds Affecting Change Through Local Leadership

AMOUNT REQUESTED : $ 300,000

OTHER FUNDING SOURCES AND AMOUNTS :

Local RC&D/SCS Operations $ 301,270

TOTAL PROJECT COST : $ 601,270

PROJECT ABSTRACT (Prepared and submitted by applicant)

Like many states throughout the United States, Montana continues its roller coaster ride with major structural economic change. With declining financial resources at federal, state, and local levels, this change calls for increased involvement and leadership from Montana citizens. In order to embrace and manage this change, this proposal will outline a program designed to build Montana citizens' involvement and leadership by utilizing an already existing program known as the Resource Conservation and Development (RC&D) Program.

RC&D areas are local non-profit corporations that draw their leadership from local communities. Within the organizational structure are councils that are charged to direct the program at the local level by combining a planning and implementation process that addresses their objectives. Depending on the area, the council makeup includes representatives of conservation districts, county commissioners, city and town councils, planning boards, local economic development authorities, Indian tribes, and other interested groups. Montana currently has five RC&D areas.

Nationwide, RC&D programs are administered by the U.S Soil Conservation Service (SCS). Montana RC&D areas have a strong partnership with SCS and the Montana Department of Natural Resources and Conservation (DNRC), each of which contributes resources to further the RC&D process.

Since the mid 1980s, Montana RC&Ds in partnership with the SCS and the Montana DNRC have been attempting to address the need for a sustained, coordinated, locally-led effort positioned to bring to bear all the needed resources on the problems facing rural Montana. This proposal requests RDGP funds to continue the local institutional development, utilizing the RC&D program to increase the radius of trust and a sense of control over destiny in rural Montana.

Rather than attempting to create another rural economic development program or spend limited state and local funds on a handful of projects, the RC&D area in each region of Montana will position itself as a locally-led rural economic development vehicle that focuses its efforts through a regional rural economic development plan. The councils will not attempt to duplicate existing federal, state, and/or local programs, but will assist in the delivery of existing programs when requested to do so.

TECHNICAL ASSESSMENT (Prepared by DNRC)

The overall goal of this program is to establish the RC&D program as Montana's regional rural economic development delivery vehicle through local leadership, coordination, and technical assistance. Currently Montana has five established RC&D areas, with an additional area scheduled for start-up in the winter of 1994. Through a series of planning workshops, area RC&Ds and the Montana RC&D Association intend to develop area and statewide planning documents by July 1995.

The RC&D councils would provide assistance by establishing an area plan. Problems in the area would be assessed and prioritized. Broad goals and specific objectives would be set, and proper courses of action would be determined. Although each RC&D council has its own locally developed goals, the general aim of RC&D projects includes rural economic development, community improvement, natural resources improvement, forestry, recreation and tourism, water quantity and quality, and information and education.

The area plans would focus on identifying local needs, developing local solutions, and coordinating available resources. Regional plans with potential statewide impact would be developed by the RC&D Association. The plans would be followed by development of an estimated 35 projects statewide.

The creation of regional rural economic plans and a state plan is a worthy effort that would likely complement rather than duplicate similar activities being conducted by other agencies, including the Department of Commerce. RC&Ds are effective organizations for dealing with rural development issues.

FINANCIAL ASSESSMENT

The application lists the following RDGP budget categories and amounts:

Salaries and wages	$ 102,648
Employee benefits	$ 28,741
Contracted services	$ 112,611
Supplies and materials	$ 7,000
Communications	$ 14,000
Travel	$ 28,000
Miscellaneous	$ 7,000
TOTAL	$ 300,000

The budget is difficult to assess. First, the involvement of and need for seven half-time clerical/program assistants for two years ($131,389) at this juncture is not clear. It is possible that, given the regional/statewide focus of this program, a portion of the duties/responsibilities of these positions could be consolidated. This should be explored by the applicant. Also, if the clerical/program assistant positions are found to be largely clerical in nature, the possibility of hiring temporary, contracted clerical personnel should be likewise investigated. As the program matures, the need for and duties of these positions should become clearer.

Secondly, as stated by the applicant, contracted services for market and feasibility studies and workshops cannot be predicted with any degree of certainty until projects are identified. The figure of $112,611, however, appears low (38 percent of the grant), considering their importance to fulfilling the overall program goal. Assuming savings in salaries and wages, these areas should be given increased emphasis.

The cost of supplies and materials seems reasonable, as does the cost of communications. Travel costs are not documented ($4,000/RC&D x 7 = $28,000). Neither the number of council members nor trip details were provided to allow an accurate assessment of their inclusion.

In short, the budget needs more documentation on how costs were derived and need. The need for and detail of all costs must be thoroughly examined in the context of the success to date in defining, prioritizing, and implementing projects under the 1991 grant award ($170,000). This will likely occur during contract negotiations for this request.

ENVIRONMENTAL EVALUATION

Impacts to the environment cannot be assessed until actual plans are formulated. Site-specific analyses to include potential effects on the physical and human environments must be performed.

PUBLIC BENEFITS ASSESSMENT

Benefits of this project include providing funding for regional organizations to assist local efforts aimed at saving and creating jobs, adding value to local resource commodities, building and maintaining infrastructure, and demonstrating new technologies. Some of the projects completed or underway through RC&Ds deal with business incubators, a government procurement program, reclamation, recycling, forestry, agricultural development, water quality, loan pools, marketing, weed control, and business development.

RECOMMENDATIONS

A grant of up to $300,000 is recommended for this project subject to the following contingencies.

1. DNRC must approve the project scope of work and budget.

2. The project sponsor must conduct a reexamination of project costs and priority elements/tasks in the context of the 1991 grant award, under which, at the time of this writing, projects are just commencing.

APPLICANT NAME : Montana Department of Health and Environmental Sciences/Water Quality Bureau

PROJECT/ACTIVITY NAME : Nonpoint Source Pollution Control in Montana

AMOUNT REQUESTED : $ 300,000

OTHER FUNDING SOURCES AND AMOUNTS :

Environmental Protection Agency	$ 1,245,102
Landowners	$ 225,600
Private Foundation	$ 100,000
Soil Conservation Service	$ 70,000
Project Sponsor	$ 60,580
Conservation Districts	$ 8,200

TOTAL PROJECT COST : $ 2,009,482

PROJECT ABSTRACT (Prepared and submitted by applicant)

Montana has over 175,000 miles of intermittent and perennial streams (only two states have more), nearly three-quarters of a million acres of lakes (only five states have more), and two million acres of wetlands. The quality of Montana's waters is substantially impacted by nonpoint source pollution (NPSP). NPSP results from diffuse discharge normally associated with agriculture, silviculture, mining, hydromodification, construction activities, and urban runoff. According to the 1990 305(b) Report, on "Montana Water Quality", NPS pollution accounts for **over 90 percent** of the total water pollution in Montana. The report further states that 25 percent of Montana's perennial streams and 75 percent of its lakes are impaired from NPS pollution. EPA has reported Montana to have more miles of polluted streams than any other state in the nation except Oregon (1990 National Water Quality Inventory).

The enactment of Section 319 of the Federal Water Quality Act (WQA) of 1987 authorized financial assistance to states to help them implement NPS pollution control programs. In order to be eligible for financial assistance on a 60 percent federal-40 percent state match, the Water Quality Bureau of DHES developed a State Assessment Report (1988) and a State NPS Management Plan (1990) that outlines strategies on how Montana could best address its NPS problems.

In recent years there have been an increasing number of requests from landowners,

irrigation districts, conservation districts, etc., asking for assistance to assess NPS pollution in their local water bodies and to plan and implement "Best Management Practices" (BMPs). Montana's NPS Management Plan emphasizes the need for technical and financial assistance to help land users voluntarily implement BMPs. There exists a Montana NPS Task Force comprised of 37 members representing state and federal agriculture, silviculture, and resource extraction. This task force oversees the NPS program, targeting high priority projects throughout the state.

The funds requested in this proposal are crucial to the success of an effective NPS program in Montana. These funds would serve as leverage for federal 319 matching funds and private contributions. Examples of projects that are pending include:

1. Water quality assessment of the irrigation drain water/tailwater - the Fort Shaw and the Buffalo Rapids Irrigation Districts

2. Watershed planning/implementation of BMPs - Big Otter Creek, Deep Creek, Careless Creek, Smith River, and Nevada Creek

3. Demonstration projects showing new BMP technology - the Little Powder River and the Ruby River

4. Nonpoint water body assessment - 340 streams in Montana

This list is just a representative sample of the water quality project assistance that local groups are requesting. If the state matching funds are not available, federal funding for NPS pollution control will be difficult to obtain. With adequate state funding to leverage available federal and local monies, the Water Quality Bureau would be in a proactive position to help Montana residents solve their water quality problems.

TECHNICAL ASSESSMENT (Prepared by DNRC)

The problem and need have been thoroughly assessed and documented in *Montana Water Quality, Montana 305(b) Report, 1990* and *Montana Nonpoint Source Assessment Report*, DHES/Water Quality Bureau, August 1988. The applicant has developed a well-reasoned, achievable strategy for dealing with the identified nonpoint source pollution problems, as outlined in *State of Montana, Nonpoint Source Management Plan*, DHES/Water Quality Bureau, 1990.

The existing nonpoint program utilizing RDGP funds has been funded since July 1989. The nonpoint source program in Montana has had federal funding since late 1989. On-site work on the first demonstration projects began in the summer of 1990. The Otter Creek project in Sweet Grass County and the East Spring Creek project in Flathead County are nearing completion. BMP installation began in 1990 on Otter Creek, and preliminary monitoring results have already shown a substantial drop in sediment

production. Although the application does not provide detail describing the technical aspects of the selected projects, the methods used to develop, administer, and implement demonstration projects seem to be working well.

Projects currently being considered for prioritization as watershed/demonstration projects are:

Big Otter Creek - Judith Basin and Cascade Counties
Deep Creek - Broadwater County
Careless Creek - Musselshell County
Nevada Creek - Powell County
Smith River - Meagher County
Little Powder River - Powder River County

The alternative of a regulatory program was briefly discussed. It is stated in the application that a regulatory approach would not be widely accepted, nor would it provide positive results compared to the voluntary program. No data are given as to how the applicant arrived at this conclusion. A cost/benefit comparison between a regulatory and a nonregulatory program would provide some data useful in evaluating the alternatives. A possible combination of regulatory and voluntary nonpoint source pollution control practices could be explored. Practices that would reduce costs for the landowner, such as irrigation scheduling, would more likely be voluntarily applied. Practices that would place additional costs (time, money, loss of flexibility, etc.) on the landowner, such as fencing riparian areas, may have to be mandated.

FINANCIAL ASSESSMENT

The RDGP budget summary is shown below:

CD salaries and wages	$ 25,000
CD employee benefits	$ 5,000
Contracted services	$ 270,000
TOTAL	$ 300,000

Landowners must contribute 25 percent of the funding for demonstration projects; this contribution can be in the form of labor and in-kind services. Costs of the demonstration projects were based on the average cost of projects currently on-line, rather than on engineering estimates of the costs of the six proposed projects.

NPS is receiving a significant amount of funding from the EPA. DHES must secure a 40 percent match to be eligible for EPA funds.

RDGP has already funded two nonpoint source pollution control grants, one for $262,573 in 1989 and another for $146,620 in 1991. The nonpoint program is behind schedule in

using the grant funds obtained so far. Currently only the 1989 grant is under contract, and only $11,470 of these funds has been disbursed. The 1991 grant money was scheduled to be used from May 1990 to December 1991, but this grant is not yet under contract. The Water Quality Bureau plans to spend the current grant application money from July 1993 to June 1995. It appears that the bureau may have some difficulty in meeting this schedule.

ENVIRONMENTAL EVALUATION

The beneficial or adverse impacts that will occur are dependent on the individual projects funded through the NPS program.

If best management practices are applied on a widespread basis, it is expected that the reduction of soil erosion and improvement of water quality would be significant in the long term. Additional benefits could be realized through improved wildlife habitat, decreased water treatment costs, and improved land and water management. Short-term water quality, noise, and dust problems could result from installation of certain structures such as headgates or riprap.

PUBLIC BENEFITS ASSESSMENT

The agricultural watershed/demonstration projects implemented under the program would reduce erosion and sedimentation and minimize property damage, susceptibility of adjacent lands to flooding, and damage to irrigation structures and equipment. Public health, safety, and welfare would be improved, especially with regard to drinking water supplies. Nonpoint source pollution control measures should reduce pathogens in surface waters, decrease bioaccumulation of metals and pesticides in tissues of fish and other organisms consumed by humans, and lower the amount of nitrates that can cause infant health problems. Also, eutrophication of water bodies from excessive nutrient discharge would be reduced. Benefits would be primarily site-specific on the water body or stream selected, but would also accrue to downstream users to some extent. Statewide benefits of water quality improvement would be gained if best management practices are eventually applied voluntarily on a widespread basis.

Typically, local contractors would be hired to complete the designed project plan, creating some local and short-term labor and material needs. Improved water quality is important to Montana's growing tourism and recreation industries. When best management practices are applied, they can help reduce loss of agricultural ground due to erosion and flooding.

This project would implement demonstration projects on up to six (6) severely impacted streams. The actual number of stream miles to be cleaned up by the project is small in comparison to the number of miles affected by nonpoint source pollution. The

remainder of streams affected are left to be treated on a voluntary basis. In some instances BMPs may qualify for federal cost-share programs such as USDA Great Plains Contracts. However, in some cases BMPs must be entirely paid for by the landowners. Any widespread effect on water quality will depend on the success of the demonstration projects and efforts of the conservation districts, Water Quality Bureau, and DNRC in convincing landowners to install or implement best management practices. The likelihood of the voluntary implementation of these practices could be explored through polls, questionnaires, interviews with landowners, research of existing information, and public forums.

RECOMMENDATION

A grant of up to $300,000 is recommended for this project, contingent upon DNRC approval of the project scope of work and budget.

APPLICANT NAME : Montana Bureau of Mines and Geology (MBMG)

PROJECT/ACTIVITY NAME : Acid Mine Drainage Prevention, Control, and Treatment Technology Development for the Stockett/Sand Coulee Area

AMOUNT REQUESTED : $ 297,245

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor	$ 101,638
Department of State Lands	$ 28,429

TOTAL PROJECT COST : $ 427,312

PROJECT ABSTRACT (Prepared and submitted by applicant)

Millions of dollars have been spent trying to remediate acid mine drainage in the Stockett/Sand Coulee coal field a few miles south of Great Falls. To date, the techniques used have focused on managing and containing mine waters, rather than designing technologies that would prevent acid mine drainage. Consequently, acidic drainage from abandoned underground coal mines continues to degrade surface water and groundwater resources in the area. Possible prevention techniques must be evaluated and documented to ensure that future control and remediation are effective and efficient.

The drainage from mines in the Stockett/Sand Coulee area has pH values between 2 and 3. While the total volume of acid drainage is not known, it is estimated to exceed 600 acre-feet per year (nearly 400 gallons per minute), based on data gathered at several sites during 1983 through 1985. Most of the alluvial aquifers in Sand Coulee and Stockett creeks have been contaminated by acid mine drainage. In a Montana Bureau of Mines and Geology (MBMG) project, nearly 50 percent of the private bedrock wells that were tested (7 out of 16 wells) showed some degree of acid mine drainage contamination (Osborne et al. 1987). Neither the acidity of the discharge nor the quantity of the discharge will decrease naturally in the foreseeable future. The Abandoned Mine Reclamation Bureau of the Department of State Lands has replaced private wells with public water supply systems in several communities. Wells have been drilled to the Madison Limestone for replacement water, and in every case the government expenses have been significant.

Elimination of acid mine drainage is based on the successful implementation of one or more of the following three approaches:

1. INTERCEPTION of recharge to the acid-producing area
2. CONTROL of the acid-producing reactions
3. TREATMENT of the acidic discharge

Interception and control techniques must be designed for specific settings, based on a thorough understanding of the local hydrologic system. A technique or combination of techniques for the Stockett/Sand Coulee area, as in the other areas of acid mine drainage, must be developed that will drastically reduce or eliminate the acid drainage. Techniques must be designed that last for a very long time and that are not prohibitively expensive.

The feasibility of all possible techniques for interception, control, or treatment of acid mine drainage will be evaluated to some degree. The most appropriate and promising treatments will be implemented and documented at one mine, the Number 6 mine, also called the Cottonwood Creek mine. Techniques that will be evaluated include (1) installation of horizontal and vertical drainage wells to intercept and reduce recharge to the mine, (2) injection of bactericide to control sulfide-oxidizing bacteria, (3) injection of rock phosphates to neutralize acid and isolate ferric ions, (4) injection of alkaline material to neutralize acidity, (5) installation of weeping wells to allow acidic mine water to move into the highly buffering Madison Limestone, and (6) construction of wetlands areas to receive the acid mine drainage flow, thus buffering and treating the water. The emphasis of the project will be on techniques that reduce the flow and the acidity of the mine drainage. Weeping wells and drainage wells will be evaluated, but not implemented during this project. All evaluations will include protection of existing water rights (both quality and quantity).

TECHNICAL ASSESSMENT (Prepared by DNRC)

The problem of acid mine drainage (AMD) in the Stockett/Sand Coulee area is well documented. A number of past attempts by the Department of State Lands (DSL) to remediate the problem--e.g., wetlands, mine sealing, vegetative measures, etc.--have been unsuccessful. The applicant argues that a thorough understanding of the vicinity's hydrogeological system is necessary to increase the chances for success. DNRC agrees with this stated study emphasis and supports a detailed investigation of the mine hydrology and local hydrogeologic system.

Considerably less clear, however, is what work would actually be implemented at the site, given a particular set of hydrogeological results. Apparently the applicant feels that two AMD preventive technologies--i.e., bactericide injection and phosphate injection--show particular promise. Why these two technologies were singled out, over a host of other preventive AMD technologies, is not clear. It appears, however, that these technologies have been possible candidates for site remediation by DSL for several years. DSL's technology screening and selection methodology is not mentioned.

The applicant further considers evaluating (1) the possibility of treating the AMD by alkaline injection, (2) the potential of vermiculite and zeolite injections, and (3) installation of weeping wells to drain acid water to the buffering Madison Limestone aquifer. Specifics as to why each of these treatment technologies was selected over other possible alternatives are not well documented. Simply funding these options at this stage, without increased specificity as to why they are incorporated into the study, seems premature, particularly given the acknowledged importance of the hydrogeological assessment in designing effective control and treatment measures.

This is not to imply that the study is without merit. The applicant has identified and will attempt to define solutions to an extremely adverse situation in the Stockett/Sand Coulee area.

It is DNRC's opinion that the situation demands the full resources of an interdisciplinary team composed of representatives from MSU, DSL, MBMG, Montana Tech, WASTEC of Butte, OSM, USBM, DHES, and EPA. In 1991, DNRC recommended and the legislature approved start-up funds for WASTEC. The screening, identification, and implementation of projects combating AMD is a major priority of WASTEC. The knowledge and experience of WASTEC, affiliated staff and researchers, and regulatory/funding agencies committed to funding cost-effective solutions to AMD in Montana cannot be ignored.

As stated in the recommendation below, DNRC is recommending that this project be co-sponsored by the WASTEC program. Because of the requirement of a WASTEC funding match of 50 percent, MBMG would have to coordinate its efforts with WASTEC efforts. This would reduce the potential for duplication and, if full funding is provided, should lead to the greatest benefit to the site.

FINANCIAL ASSESSMENT

The budget is difficult to assess. An integral part of assessing its reasonableness involves defining in precise terms what work/activities will be accomplished, associated cost, and necessity. Each of these three areas presents definite concerns. For example, a majority of projects costs (salaries, contracted services, materials, equipment, travel) would be directly tied to the investigative aspect of the study; yet, until analysis of the hydrogeological investigation is complete there is lessened confidence that the technologies proposed will be selected for evaluation and implementation. Other alternatives may be more feasible, both technically and financially, resulting in lower overall cost.

Considerable federal money has been expended addressing the Stockett/Sand Coulee AMD problem with very limited benefit. It would appear prudent to draw on these experiences and develop viable alternatives based on previous and current research, hydrogeological results gained here, and a wide array of professional AMD experience. An excellent forum for technology selection and implementation would be through the WASTEC program in Butte. Subjecting this project to the rigorous selection and evaluation criteria of WASTEC would increase its likelihood of success.

ENVIRONMENTAL EVALUATION

The proposal fails to emphasize safety controls to prevent the bactericide from entering surface waters. An event such as this would kill animal forms such as fish and insects, and the potential adverse impacts should be addressed. The release of acidic water during hydrologic assessment (well tests) also was not discussed. How any pumped water would be disposed of should be identified in the scope of work submitted in the contract.

PUBLIC BENEFITS ASSESSMENT

There is an immediate need and urgency to develop and implement successful control and treatment technologies for acid mine drainage. Success here would probably be applicable to other mines in the area, and possibly statewide. Federal funds are available to apply proven technology to other mines in the Great Falls-Lewistown Coal Field.

Acid mine drainage has been occurring in the area for many years, progressively increasing the impact to area groundwater. As the damage extends outward, beneficial uses of uncontaminated water are lost, and more people have to seek alternative domestic water sources. The impact is significant on both the human and physical environment.

This project envisions development of technology to lessen the severity of AMD. If successful, this technology would reduce unacceptable environmental damage, help improve public resources, help prevent property damage, and help protect public health, safety, and welfare. All Montanans would benefit from a successful project.

RECOMMENDATIONS

A grant of up to $148,623 (one-half the requested amount) is recommended for this project, subject to the following contingencies.

1. DNRC must approve the project scope of work and budget.

2. RDGP funds must be matched on at least a 1:1 basis from EPA's Mine Waste Pilot Program in Butte.

3. This state (RDGP) match is valid until June 30, 1995.

APPLICANT NAME : Jefferson Valley Conservation District

PROJECT/ACTIVITY NAME : Crystal Mine Remediation Technology Demonstration

AMOUNT REQUESTED : $ 300,000

OTHER FUNDING SOURCES AND AMOUNTS :

Environmental Protection Agency (EPA)	$ 677,000
Headwaters RC&D Area, Inc.	$ 4,996

TOTAL PROJECT COST : $ 981,996

PROJECT ABSTRACT (Prepared and submitted by applicant)

The Jefferson Valley Conservation District is seeking a Reclamation and Development Grant to assist in finding effective, cost-efficient technology to treat acid mine drainage at the Crystal Mine site in Jefferson County near Basin.

The applicant proposes to work with the Mine Waste Pilot Program (funded by EPA) located in Butte. The Mine Waste Pilot Program seeks to identify technologies that are effective in treating mine wastes, to identify gaps in the technologies, to further refine or develop those technologies, and to perform field tests to demonstrate their effectiveness.

This project, the Crystal Mine Remediation Technology Demonstration Project, would follow that exact process in order to develop a technology to treat acid mine drainage flowing from the mine adit and surrounding area.

Acid mine drainage is a serious problem adversely affecting Montana's water quality and riparian areas. Much of the technology development to date (for example, sealing the mine) has proven ineffective in treating acid mine drainage in remote areas. Some reasons for the ineffectiveness are that the technology applied is inadequate or the cost of transporting and installing the equipment and associated improvements are prohibitive.

This project would take into account all the advantages and constraints of existing technologies in order to develop a cost-effective method of treating acid mine drainage at a remote site. Passive systems requiring little maintenance or supervision may prove best for remote areas.

The Department of State Lands reports that there are 54 mines in Jefferson County alone with water flowing from them. Well over half of these have acid mine drainage problems.

If acid mine drainage is to be eliminated as a major nonpoint source of pollution, the technology must be both adaptable to other sites and cost-effective. The goal of this project is to develop such a technology and use the technology transfer capabilities of the Mine Waste Pilot Program and Montana Tech, along with tours sponsored by the conservation district and Headwaters RC&D Area, Inc., to ensure that the project and the technology are publicized.

The first phase of the project involves the research and testing of existing technologies and laboratory work that will be conducted at MSE, Inc., and Montana Tech. This phase is expected to require approximately 10 months. The second phase is transferring the technology to the field and conducting the actual demonstration. This is expected to require 12 months.

The third phase--the final report, technology transfer, and tours--will be conducted in the last months of the demonstration and in the 2 to 4 months immediately following the completion of the demonstration and analysis of the findings. In total, the project is expected to require 24 to 26 months.

TECHNICAL ASSESSMENT (Prepared by DNRC)

This proposal is a worthwhile effort to help mitigate adverse impacts from acid mine drainage (AMD). AMD is a serious problem in many areas, and additional work is needed to develop workable solutions. The proposal needs more specifics on what AMD technologies will be evaluated. It does suggest that control by mechanical sealing of the adit is not a feasible technique. It also briefly mentions the possibility of constructing a wetland. This treatment method was proposed during the last RDGP last grant cycle and was not recommended for funding due to technical problems.

A precise description of the desired goal is lacking. It is unclear whether the technology to be developed is aimed at removing metals from the water, lowering pH, improving riparian habitat, improving fisheries, or some combination of these. The scope of work is vague, with no details on what technology might be implemented. Without a definite scope of work, it is difficult to predict the final result.

The project schedule allows a short time to evaluate the effectiveness of the new technology at the mine. Some treatments work well initially but drop in effectiveness over time. It is not certain whether the project allows enough time to adequately assess the effectiveness of the technique.

The technology selection and screening process, now being formulated and eventually implemented by the Mine Waste Pilot Program and Montana Tech, will address and likely alleviate these concerns with project/technology generalities.

FINANCIAL ASSESSMENT

The budget is overly general. There is no detailed scope of work to show how the money would be expended. The proposal does not explain how costs for project implementation were derived, and there is no breakdown of cost by phase.

The proposed project budget is broken down as follows:

Grant administration	$ 6,000
Project implementation (contracted services)	
Engineering and design	$ 55,000
Procurement	$ 84,000
Mobilization	$ 25,000
Installation	$ 25,000
Demonstration	$ 59,600
Final report	$ 11,000
Project management	$ 16,000
Contingency	$ 18,400
TOTAL	$ 300,000

ENVIRONMENTAL EVALUATION

Possible secondary effects, such as erosion and sedimentation into Uncle Sam Creek from project construction, are not addressed. There is no anticipation of need for an MPDES permit from the Department of Health and Environmental Sciences' Water Quality Bureau, or for a 310 Permit from the conservation district. Both would likely be necessary for any work in or adjacent to the creek. A commitment should be made to enact Best Management Practices in order to limit sedimentation problems.

Long- and short-term adverse effects beyond these are unknown because the scope of work is unknown. There is a potential for beneficial effects with development of a successful treatment technology.

PUBLIC BENEFITS ASSESSMENT

Reducing acid mine runoff into the Boulder River basin would benefit the public positively by improving riparian habitat along the tributaries, improving spawning grounds for the Boulder River fishery, and improving the water quality in the watershed as a whole. Developing an effective treatment for acid mine runoff in hard rock metal mines would be a tremendous benefit to the public if it could then be implemented in similar settings. The location is excellent for testing an acid mine drainage technology, although other project benefits are not known due to the uncertainty of the proposal. The substantial financial and staff involvement by EPA's Mine Waste Pilot Program will contribute greatly in maximizing return on RDGP funds expended.

RECOMMENDATIONS

A grant of up to $150,000 (one-half the requested amount) is recommended for this project, subject to the following contingencies.

1. DNRC must approve of the project scope of work and budget.

2. The applicant must secure match funds in the amount of $677,000 from EPA's Mine Waste Pilot Program and $4,996 from Headwaters RC&D. A reduction in funding from these two sources shall result in a commensurate decrease of RDGP match funding.

3. Subject to the availability of funds, this RDGP match commitment is valid until June 30, 1995.

4. If responsible party investigations at this site lead to cost recovery of RDGP grant funds expended, then Jefferson Valley Conservation District must reimburse DNRC for the full amount of any such costs, including damages or penalties, that it may receive.

APPLICANT NAME : Deer Lodge Valley Conservation District

PROJECT/ACTIVITY NAME : Developing Acid/Heavy Metal-Tolerant Cultivars for Mine Reclamation

AMOUNT REQUESTED : $ 137,700

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor	$ 2,300
USDA/SCS Plant Materials Center	$ 60,580
Soil and Water Conservation Districts of Montana, Inc.	$ 10,860

TOTAL PROJECT COST : $ 211,440

PROJECT ABSTRACT (Prepared and submitted by applicant)

The Deer Lodge Valley Conservation District (hereafter referred to as district) is applying for grant monies to help initiate a project to collect and evaluate plant materials indigenous to acid- and heavy metal-contaminated soils. Very few commercial plant cultivars are available for reclamation efforts on abandoned mine lands or on new mineral extraction sites, and those available were not developed specifically for their acid/metal tolerances.

A district employee, working out of the facilities at the USDA/SCS Plant Materials Center (PMC), Bridger, will collect and assemble seeds and/or plants from metalliferous soils throughout Montana. At each collection site a representative soil sample will be taken to determine pH and major heavy metal contaminants. Collections will be made throughout the 1993 and 1994 growing seasons. All seed will be cleaned in the seed-cleaning facilities at the Bridger PMC, and all clonal material will be propagated in the PMC greenhouse. All collected material will be established in evaluation plots, either by direct seeding or transplanting. Evaluation plots will be established at the Bridger PMC and at two affected sites (near Anaconda and East Helena). All plant materials will be evaluated for ease and speed of establishment, vigor, productivity, colonization, competitive nature, survival, and longevity.

The district employee, with contracted assistance from the PMC staff, will coordinate all aspects of the project. The Bridger PMC is currently the only research facility in Montana that is collecting, testing, and releasing cultivars of native plant materials. In

1975, an employee of the Soil and Water Conservation Districts of Montana, Inc., through a cooperative agreement with the Bridger PMC, initiated a similar project to collect and test salt-tolerant plants using grant monies from the Old West Regional Commission (U.S. Department of Commerce) and Montana Department of State Lands. This project resulted in the release of two cultivars and six additional species in advanced stages of evaluation.

The availability of native, acid/heavy metal-tolerant plant material would increase the chances of reclamation success. This would help mitigate the environmental degradation of past mining and smelting activities and provide the modern day mining industry with the resources to minimize environmental degradation.

TECHNICAL ASSESSMENT (Prepared by DNRC)

The Deer Lodge Valley Conservation District proposes to conduct two initial stages of a long-term effort to make available acid/heavy metal-tolerant native plant species to commercial seed growers. The two-year conservation district project involves collection of native plant species with subsequent establishment of test plots and evaluation at two sites (near Anaconda and East Helena). Stages 3 to 5 (seed production, field testing, and release to commercial growers) would be conducted by USDA.

While the proposed project would not directly result in any cleanup, it would be useful. During the next 15 to 20 years, large reclamation projects in Montana, such as the Clark Fork Superfund Project and numerous mine reclamation projects, will require large numbers of seeds from acid/metal-tolerant plants. Although various research activities are ongoing on site-specific examples, no wide range collection and evaluation are ongoing for this geographic region. Due to the long time frames necessary to develop adequate seed supplies, this is a very timely project. However, the project will be successful only if the Soil Conservation Service's Plant Material Center carries the project forward after this initial two-year project.

The application generally discusses efforts made in the past to solve this problem, but does not mention the Department of Health and Environmental Science's Streambank Tailings and Revegetation Study (STARS). Little mention is made of using soil amendments as a solution to the problem of growing plants in soils with low pH or high concentrations of metals. The application does mention a study where native plants were more successful than introduced species when grown on soils that had been treated to increase pH.

The project was not coordinated through all local, state, and federal agencies. DNRC, however, requested reviews from representatives from MSU, Montana Tech, DSL, and DHES, and all supported the proposed study.

From the application, it is unclear why the soil and plant metal analyses are being carried out. They will not provide any information about metal tolerance in the plant itself. Soil analyses will indicate what type of metallic environment the plant is growing in but will not clarify plant tolerances. The conductivity and pH of the soils should be determined; the metal analysis of plant tissues appears unnecessary.

FINANCIAL ASSESSMENT

Project benefits are likely to exceed costs if SCS follows through on plant development. The project budget generally is properly developed. However, the relative responsibilities of the applicant and SCS are unclear, and costs for soils metal analysis at $125 per sample appear to be somewhat high. Tests for copper, zinc, aluminum, and arsenic should be about $50 per sample. Management responsibilities should be performed by Bridger Plant Materials Center personnel. Part of their time could perhaps be purchased at a cost of much less than $27,000 per year.

The RDGP budget consists of:

Salaries and wages	$ 58,000
Employee benefits	$ 8,700
Contracted services (chemical analysis, USDA/SCS consulting fees, and materials)	$ 53,000
Supplies and materials	$ 500
Communications	$ 500
Travel	$ 10,000
Rent	-0-
Equipment	$ 2,000
Miscellaneous	$ 5,000
TOTAL	$ 137,700

The project could take 6 or more years to complete. In order to maximize project benefits, a long-term funding source must be secured.

ENVIRONMENTAL EVALUATION

The project is unlikely to have any substantial adverse impacts. There may be some minor disturbances at already impacted sites when samples are collected. The project could have substantial long-term benefits if acid/metal-tolerant plant species are developed and used in reclamation. A reliable supply of quality seed would aid reclamation attempts. A permanent plant cover could reduce wind and water erosion, sedimentation, and air pollution.

PUBLIC BENEFITS ASSESSMENT

If native indigenous cultivars could be made available for use on drastically disturbed areas, then reclamation attempts would be more successful and, in most cases, less expensive. Successful revegetation of acid/heavy metal-affected land would benefit Montanans by improving the quality of surface water and subsurface water within the affected watershed, increasing vegetative production, and improving recreational and visual quality.

RECOMMENDATION

A grant of up to $137,700 is recommended for this project, contingent upon DNRC approval of the project scope of work and budget.

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APPLICANT NAME : Glacier County Conservation District

PROJECT/ACTIVITY NAME : Comprehensive Evaluation of Groundwater Contamination, Red River Drainage

AMOUNT REQUESTED : $ 214,059

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor	$ 16,407
MBMG	$ 83,454

TOTAL PROJECT COST : $ 313,920

PROJECT ABSTRACT (Prepared and submitted by applicant)

Glacier and Toole Counties in northwestern Montana contain thousands of oil and gas wells and as such are one of the leading producers of oil and gas in Montana. The area is also a major producer of dryland wheat and barley. These activities have caused numerous complaints of groundwater contamination as a result of saline seep, leaking brine pits, faulty seals between production piping and casing, etc.

The Glacier County Conservation District proposes to document the extent of groundwater contamination due to oil field and agricultural activities in the 55,000 acres surrounding the Red River Valley drainage. This project will evaluate current groundwater quality and compare it with historical data to determine the presence or

absence of water quality trends. The evaluation will also provide baseline data to assist in the evaluation of future groundwater impacts due to oil field and agricultural activities.

Water wells, oil wells, and injection wells will be inventoried and mapped, and hydrogeologic investigations will be performed at selected sites. Groundwater occurrence, flow, and pollution vulnerability will be assessed with particular emphasis on those aquifers used as a drinking water supply. Where water supplies are judged to be vulnerable, water samples will be collected and analyzed. A final report will include program accomplishments, conclusions, and recommendations for remediation with statewide applicability. All activities and reporting will be carefully coordinated to augment or assist existing programs by the Montana Salinity Control Association (MSCA), Montana Department of Health and Environmental Sciences (DHES), Montana Department of Agriculture (MDOA), Montana Department of Natural Resources and Conservation (DNRC), and Montana Department of State Lands (DSL). Public information dissemination will be accomplished through local conservation districts by coordination with the Statewide Resource Conservation and Development organization.

TECHNICAL ASSESSMENT (Prepared by DNRC)

The needs assessment by the applicant consisted of a field tour and two-day meeting attended by 75 people in 1989 and reference to two reports on water quality. Details on the technical information gathered as a result of the two-day meeting were not given in the application. One of the problems this project would address is a lack of technical information concerning the groundwater in this area. The applicant mentions reports of leaking brine pits, breaching of pit safety berms, and bursting of crude oil production mains. Landowner interviews conducted by the project sponsor to document these types of problems would aid, to some extent, in pinpointing problem areas and verifying the severity of the problem.

Alternatives to the proposed technical design were not thoroughly explored. One appropriate alternative would be to conduct the inventory aspects of the evaluation before outlining costs of specific hydrogeologic investigations. Results of the inventory work would provide a more convincing case of the need for this evaluation and give sound cost estimates of site-specific investigations. This project could be split into two grants or at least into two distinct phases.

Several reviewers thought the project goals and objectives could have been better developed. The project objectives may be too broad or involve too large an area to be reasonably attained. Overall, reviewers thought the actual investigations/assessment portion of the project was adequately designed, with one exception. The applicant lists the activities to be accomplished; however, details on conducting field verification were lacking. There is concern that this project may duplicate activities available in this area

under the DHES Wellhead Protection Program and the nonpoint source pollution control programs administered by DHES and MSCA.

Computer modeling of the aquifer system and the geochemistry would improve a study like this. Modeling was not included in the application. This information could be incorporated into a compilation of all the saline-related studies in northern Montana and entered into a Geographic Information System where the data could be further manipulated. This project would provide more specific data and should be coordinated with the Groundwater Information Center, Groundwater Steering Committee, and Groundwater Assessment and Monitoring Program. A statewide groundwater monitoring program was established in the 1991 legislature, giving MBMG funds to monitor quality and quantity of groundwater across the state.

The applicant should incorporate a plan to use the evaluation results in developing and funding actual cleanup projects. Who will be responsible for actual cleanup activities, and how will these activities be funded? The applicant should consider organizing a water quality district. The district board could be made up of local landowners, a CD representative, representatives from the oil and gas industry and from agricultural interest groups, etc. This make up would facilitate cooperation among local groups. The district could take steps to raise funds locally for site-specific studies and/or for remediation measures.

FINANCIAL ASSESSMENT

The RDGP budget summary is shown below:

Salaries and wages	$ 72,440
Employee benefits	$ 15,431
Contracted services	$ 79,070
Supplies and materials	$ 10,400
Communications	$ 1,000
Travel	$ 26,168
Rent and utilities	$ 7,450
Equipment	$ 2,100
TOTAL	$ 214,059

Several of the budget items need clarification.

1. The estimates for monitoring well construction and water quality analyses appear to be largely hypothetical at this point. This is understandable since well drilling and some sampling would be a part of the site-specific investigations and would be determined by the initial inventory. However, the budget narrative should

present some basis for the estimates of numbers of water samples and feet of drilling. Estimates should also be revised for all activities following inventory work, as the nature of site-specific investigations is developed.

2. The conservation district's charging $7,450 for rent and utilities lacks justification.

3. Detail and estimates on the rental of equipment are lacking, and costs appear high.

Technical review indicated that several budget items could be reduced. One reviewer commented that the two-year time to do the inventory could be shortened. Lessening the duration of the project would allow reducing the costs of salaries and fringe benefits.

ENVIRONMENTAL EVALUATION

This project would have minimal environmental impact. Drilling of groundwater monitoring wells would cause minor surface damage, and the monitoring wells could themselves pose a threat of groundwater contamination. Proper methods used in drilling, operating, and abandoning the monitoring wells should mitigate this potential for impact.

PUBLIC BENEFITS ASSESSMENT

Public support for this project was not well documented. The tour and public meeting were mentioned, but details were not given. Several other methods of assessment such as landowner surveys or polls would be helpful in documenting need and public support. The coordination of this project appears to have been between MBMG, MSCA, and the conservation district. Other agencies such as EPA, the Montana Board of Oil and Gas Conservation, and the U.S. Geologic Survey should be involved.

The applicant states that the first step toward mitigation of environmental damage to public groundwater resources due to oil field and agricultural activities is the assessment of the extent of groundwater contamination. The final product of this project would be a groundwater evaluation of the area. According to technical reviewers, this project would be useful for identifying existing water quality problems and locating land use areas with the potential to cause such problems.

The applicant lists long-term benefits of improving and ensuring the quality of groundwater, protecting drinking water supplies, safeguarding fish and wildlife from contaminated groundwater discharge to surface water, and protecting or reclaiming agricultural lands and wildlife habitat. Because the product of the proposed project would be data, the proposal could not directly accomplish these results. To realize the on-the-ground benefits envisioned by the applicant, two things are necessary.

First, the data that would result from the study must be communicated. A strong plan of how to get the results of this study out to the necessary parties and how the information can be put to practical use is necessary. Glacier County Conservation District's hosting a workshop is the only activity planned to disseminate information. A statewide public education program and several agencies are mentioned, but it is unclear if this is an actual objective to be carried out by the applicant.

Second, mechanisms are needed to translate the study data into management changes in order for the project benefits listed by the applicant to be achieved.

Possible benefits would be received mainly by the residents in the study area. One full-time and three part-time jobs would be filled during this study.

RECOMMENDATIONS

A grant of up to $214,059 is recommended, subject to the following contingencies.

1. DNRC must approve the project scope of work and budget. The scope of work must incorporate a plan to organize and obtain funding for cleanup activities. Budget items must be clarified, and documentation of estimates must be given when the scope of work is drafted. Estimated items needing documentation are well drilling, water sampling, printing costs, and equipment rental. Rent and utility costs must be justified.

2. Project activities must be coordinated with the MBMG Groundwater Information Center and the Statewide Groundwater Assessment and Monitoring Program.

APPLICANT NAME : Valley County

PROJECT/ACTIVITY NAME : Fort Peck Reservoir Breakwater

AMOUNT REQUESTED : $ 300,000

OTHER FUNDING SOURCES AND AMOUNTS :

DNRC Water Development Grant (applied for)	$ 100,000
Corps of Engineers	$ 400,000

TOTAL PROJECT COST : $ 800,000

PROJECT ABSTRACT (Prepared and submitted by applicant)

This project helps satisfy a crucial need in eastern and central Montana by providing boaters on Fort Peck Lake a safe harbor where they can store and launch their boats on the lake. This will be done by constructing a breakwater across an existing bay near the west side of Fort Peck Dam. The breakwater will protect the inside of the bay from large waves while providing access to the lake from the bay.

With a lake as big as Fort Peck Lake, waves can build up significantly with the wind. During storms, the waves can be large enough to damage boats that are left at docks exposed to the waves. Construction of a breakwater will provide this safe harbor. It will allow more development of marina facilities in the future. This, in turn, will increase the recreational use of the lake.

Expanding the use of Fort Peck Lake has been a long-time goal for the people of eastern Montana. The original *Fort Peck Lake Master Plan*, in 1946, talked about the potential for recreation the lake would bring to eastern Montana. The 1986 Governor's Forums on Montanans Outdoors recognized the recreational potential of the lake and that this potential needed to be developed. Much has been said about recreational development, but little has been done. This project will provide for better use of the water resource in the lake, develop much needed recreation, and at the same time provide some greatly needed economic development opportunity in the surrounding area.

TECHNICAL ASSESSMENT (Prepared by DNRC)

The applicant proposes to construct a dike across a portion of Perch Bay, dewatering the bay, removing fill material from the bay to construct a breakwater, and, finally, cutting a hole in the breakwater to provide access from the existing boat launch and Fort Peck West Marina. Construction would begin in May and be completed in September. During at least a portion of the construction period, the privately operated marina and boat launching facilities would be inaccessible. This could present a serious adverse effect to the marina, but, if the marina business could survive the one year of lost business, the marina might become more attractive to recreationists and expand.

Technical details of the project design are very preliminary at this time. A source of durable riprap has not been identified. In addition, the size of the riprap proposed to protect the breakwater may be too small to prevent erosion. The nearest source might be south of Malta about 80 miles away. This area was the source of riprap when Fort Peck Dam was built.

When the application was reviewed, the reservoir was at its lowest level in 30 years. Urgency for the project derives from the present low water level, which would make construction much easier and less costly. There is no way to know whether lake levels will rise before construction would be completed or whether construction could be deferred for two to three years until project details are resolved.

FINANCIAL ASSESSMENT

Cost estimates are also very preliminary, and further detailed design work is needed to refine them. The preliminary cost estimates may be low for these reasons.

1. Riprap may have to be transported from a site south of Malta.

2. Riprap used on the lake side of the breakwater may have to be larger than the 24-inch size used in the preliminary design in order to protect the breakwater from wave erosion.

3. A thicker riprap blanket may be required on the lake side of the breakwater.

A DNRC cost estimate based on the assumption that quantities listed in the application are correct is provided in the following chart, along with the applicant's estimate. The Montana Department of Transportation's *Tabulation of Low Bid Prices and Computations of Average Prices for 1991* was used to estimate costs. Costs for mobilization and foundation stripping were left out of the original estimate. The percentage for contingencies was revised upward because of the very preliminary nature of this project design. The applicant's estimate for dewatering cost may be low, but has been used. A 20 percent allowance was made for settling in the embankment. The applicant's

estimates of costs for engineering design, contract administration, and soils testing appear reasonable at $129,000.00.

Comparison chart of cost estimates

DNRC Cost Estimate				Applicant's Estimate
Item	Quantity	Unit Cost	Total Cost	
Mobilization (5%)	1	LS	$ 52,300	0
Stripping	1	LS	$ 50,000	0
Embankment	115,000 cy	$3.35	$ 385,250	$ 172,500
Riprap	15,000 cy	$33.20	$ 498,000	$ 375,000
Geotextile	17,000 sy	$2.30	$ 39,100	$ 17,000
Seeding	20 acres	$1,970.00	$ 39,400	$ 12,000
Dewatering	1	LS	$ 35,000	$ 35,000
Subtotal			$1,099,050	$ 611,500
Contingency			$ 219,810	$ 59,500
Total Construction Cost			$1,318,860	$ 671,000
Soil Testing, Engineering Design, and Contract Administration			$ 129,000	$ 129,000
Grand Total			$1,447,860	$ 800,000

cy - cubic yards
LS - lump sum
sq - square yards

No funding has been secured for long-term maintenance of the breakwater. Neither local nor private funds have been contributed to the project, even though the breakwater has been proposed to stimulate local economic development.

ENVIRONMENTAL EVALUATION

As stated previously, the marina and boat launching facilities would be dewatered for at least a portion of the construction period. This would adversely affect the marina business. An unknown number of fish could be killed when the bay is dewatered. While sediment would be produced and adversely affect water quality during construction, shoreline erosion should decrease afterwards. No measures are proposed to reduce adverse effects, but performing construction when the lake is low should reduce sediment production. The effect of the project on threatened or endangered species is unknown. Temporary increases in dust, noise, and construction traffic are expected.

PUBLIC BENEFITS ASSESSMENT

While the proposal is preliminary, need for the project is acknowledged among the users and agencies familiar with recreation at Fort Peck. The proposal indicates that 60,000 people would benefit directly from the project and 200,000 indirectly. However, there is no indication how these numbers were determined. Stated objectives will meet a legitimate need, but the application fails to make a convincing case that there is a "crucial" state need. The project would not eliminate severe and unacceptable damage to public resources, and public benefits may not be considered extraordinary. Not constructing the project does not present a serious threat to public health and safety. While a safe harbor would provide a haven for recreationists in extreme weather, the more common benefit would probably be protection of boats and docks.

RECOMMENDATION

A grant of up to $300,000 is recommended for this project contingent upon DNRC approval of project scope of work and budget.

APPLICANT NAME : Montana Department of Natural Resources and Conservation/Water Management Bureau

PROJECT/ACTIVITY NAME : Arsenic Transport and Mobility in Surface Water, Irrigated Soils, and Shallow Groundwater of the Upper Missouri River Basin

AMOUNT REQUESTED : $ 229,989

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor	$ 38,333
Montana State University	$ 89,387
U.S. Bureau of Reclamation	$ 220,500
U.S. Geological Survey	$ 158,325

TOTAL PROJECT COST : $ 736,534

PROJECT ABSTRACT (Prepared and submitted by applicant)

Water of the Madison and upper Missouri rivers has elevated concentrations of arsenic that frequently exceed the federal drinking water standard of 50 micrograms/liter. In the Madison drainage, long-term irrigation with river water having arsenic concentrations in the 50- to 80-microgram range has resulted in a two- to three-fold increase in shallow groundwater arsenic concentrations. In order to minimize public health risks, there is a need to evaluate the occurrence, mobility, and transport of arsenic in existing irrigated soils and shallow groundwater of the Madison and Missouri River basins.

Recently, the Montana Department of Health and Environmental Sciences (DHES) adopted ambient surface-water standards for arsenic that prevent any new irrigation in Montana where consumptive use of water will increase concentrations of arsenic in surface water or groundwater. The Board of Natural Resources and Conservation conditioned Missouri River water reservations such that an applicant must demonstrate that the project will not violate Montana water quality standards or other applicable laws. Resource managers (including DNRC, USBR, and DHES) need the ability to predict effects that changes in land and water management will have on arsenic transport and mobility in surface water, irrigated soils, and shallow groundwater of the upper Missouri River basin.

The goals of this project are to:

1. Measure existing concentrations of arsenic in shallow groundwater and soil profiles or representative irrigated fields and evaluate factors controlling arsenic mobility and distribution (in the Madison drainage and Missouri drainage between Townsend and Three Forks) (PHASE I)
2. Collect field data to develop and test empirical and theoretical models of arsenic mass balance in irrigated soil profiles and fields and predict the short-term (first 5 years) and long-term (>30 years) mobility and transport rates of arsenic supplied by irrigation water (PHASE II)
3. Collect surface-water quality data to calibrate and verify an arsenic transport model for the upper Missouri River basin above Canyon Ferry and evaluate the effects land and water management options may have on arsenic concentrations in the Madison and Missouri rivers (PHASE III)

This project will be conducted as a cooperative effort of the U.S. Bureau of Reclamation (USBR), Department of Natural Resources and Conservation (DNRC), Montana State University (MSU), and U.S. Geological Survey (USGS). In Phase I, a reconnaissance-level, soil and shallow groundwater sampling investigation will be conducted by USBR to provide a preliminary evaluation of factors (land use, geology, soil type) controlling arsenic mobility in existing irrigated soils of the Madison and Missouri River drainages. A more intensive investigation of soil chemical and physical processes controlling arsenic transport and mobility and measurement of the arsenic budget (mass balance) of representative irrigated fields will be conducted by MSU and USGS in Phase II. In Phase III, surface-water quality data pertinent to arsenic transport will be collected by USGS at nine stations on the Madison/Missouri mainstem over an 18-month period, and this information will be used by DNRC and USBR to calibrate and verify an arsenic transport model. Several scenarios representing alternative water allocations and management will be developed and effects on arsenic concentrations in surface water and municipal water supplies will be modeled.

Results of the project will benefit all water users in the upper Missouri basin. Domestic water users who rely on groundwater supplies will benefit from knowledge of existing arsenic contamination problems. In addition, it may be possible, depending upon management goals, to minimize further contributions of arsenic from existing contaminated soils and groundwater through development of alternative irrigation-water management strategies. Given the strong likelihood of a more stringent arsenic drinking water standard and the associated treatment costs, municipalities will benefit from an evaluation of arsenic in existing and anticipated future water supplies. A more complete understanding of the upper Missouri basin arsenic cycle will enhance the ability of state and federal agencies to evaluate and manage public health risks resulting from exposure to arsenic.

TECHNICAL ASSESSMENT (Prepared by DNRC)

The major goal of this proposal is to evaluate the occurrence, mobility, and transport of arsenic in existing irrigated soils and shallow groundwater of the Madison and Missouri River basins. Arsenic concentrations are above current state and federal water quality standards in both river systems. This poses both a human health risk and an environmental problem. An understanding of arsenic transport would help land and water managers reduce or prevent environmental degradation from increased arsenic concentrations in groundwater and protect human health and safety by controlling arsenic concentrations in domestic and municipal water supplies.

Reviewer support for this proposal was mixed, with discussion focusing on the modeling approach proposed. This project would produce an abundance of data that then must be generalized and simplified in order to produce the model. Given that arsenic adsorption isotherms can vary radically within a single field, choosing "representative" sample sites and soil profiles may be extremely difficult. The applicability of these results to other fields and aquifers is questionable.

The competing role of phosphate is mentioned as a controlling factor in arsenic transport, but the model does not address past fertilizing history. The application also does not mention past pesticide use, although many pesticides contain arsenic. It is not clear that total recoverable arsenic will be analyzed in the groundwater and soil solution extracts. The proposal discusses irrigation but does not clarify the exact nature of the irrigation. Watering thoroughly and infrequently, instead of often and lightly, may create oxygen deficient conditions that, in turn, influence arsenic mobility. Fluctuating water tables also influence the fundamental factors (pH, redox, and competing ions) that control arsenic mobility. An emphasis on these fundamental factors would simplify this study.

The model would address arsenic transport in the Madison River basin and the Missouri River basin above Canyon Ferry. It would not address arsenic in the Missouri below Canyon Ferry. It is likely that more work would need to be done to address arsenic transport below Canyon Ferry.

FINANCIAL ASSESSMENT

Project costs to be covered by the RDGP grant are broken down by phase as follows:

PHASE I	-0-
PHASE II	$ 163,443
PHASE III	$ 66,546
TOTAL	$ 229,989

The budget is well documented and clear. For the level of work being proposed, it appears to be reasonable. Non-RDGP funds provide nearly 69 percent of the total project cost.

ENVIRONMENTAL EVALUATION

The project potentially would indirectly have a major beneficial impact on water quality in the upper Missouri River basin by allowing reliable evaluation of the effects of land and water management alternatives on arsenic concentrations. In turn, this could potentially have major positive effects on health and human safety. With the exception of minor, short-term disturbances that are associated with data collection (for example, well installation, and soil sampling), there would not be an adverse impact on the environment from this project.

PUBLIC BENEFITS ASSESSMENT

An increased understanding of arsenic transport would help water managers reduce damage to public resources and protect the public health, safety, and welfare. Most Montanans would benefit from this knowledge because high arsenic concentrations affect water quality in a large portion of Montana. This knowledge may help to reduce damage to agricultural lands.

Project benefits are not certain because of the modeling difficulties presented by soil and water variability. A successful model would have long-term benefits.

There is an urgent need to develop management plans for arsenic based on a thorough understanding of its mobility and transport characteristics because of the existing federal and state water quality standards. A large area of Montana is affected by this problem, as well as a large portion of the population.

RECOMMENDATION

A grant of up to $50,000 is recommended for this project contingent on DNRC approval of the project scope of work and budget. Funds shall be used to collect and analyze additional water quality data for water quality model calibration and verification.

APPLICANT NAME : Ravalli County

PROJECT/ACTIVITY NAME : A Lake For Better Water Quality (Como Lake Dam Rehabilitation)

AMOUNT REQUESTED : $ 300,000

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor	$ 56,485
Bitterroot Irrigation District	$ 200,000
Corporate, Foundation, and Private Donors (to be solicited)	$ 1,451,500
Federal (tentative)	$ 3,000,000

TOTAL PROJECT COST : $ 5,007,985

PROJECT ABSTRACT (Prepared and submitted by applicant)

There have been chronic shortages of water in the Bitterroot and Clark Fork rivers and in Como Lake from a standpoint of water quality, fisheries, and recreation. In 5 of the last 27 years, there has also been a shortage of water in Como Lake for irrigation. Enlarging the Como Lake Dam would allow more storage of excess spring runoff water for timed release when most needed to improve these deficiencies of water quality and quantity.

Como Lake is located 14 miles southwest of Hamilton. The total cost of the project to raise the dam 8.7 feet is $5 million. The 8,200 acre-feet of additional high quality water will serve four primary objectives: (1) help improve water quality and the fisheries in the Bitterroot River, (2) dilute high nutrient concentrations in the Clark Fork and lower Bitterroot rivers, (3) provide additional irrigation water in drought to over 785 irrigators on 16,635 acres of land, and, (4) add over 220 acres of surface water to Como Lake.

One-half of the additional storage, 4,100 acre-feet, is reserved to augment late season streamflow in the Bitterroot and Clark Fork rivers. The rate of release will be based on recommendations of the Montana Department of Fish, Wildlife and Parks (DFWP). At a rate of 100 cubic feet per second, releases would last three weeks. This release has the dual potential of markedly improving the fisheries in the Bitterroot River and also diluting both nitrogen loading in the Bitterroot River from the Missoula aquifer and

nutrient discharges from the Missoula municipal wastewater treatment plant. Additional clean water may help avoid future violations of water quality standards.

The other 4,100 acre-feet would be placed in long-term storage primarily for recreation in Como Lake. In drought years when there is not enough water to fill the historical irrigation rights, up to one-third of this water would be used for irrigation, with the remainder split between storage and instream flow.

The U.S. Bureau of Reclamation (USBR) has found the current dam unsafe. Because of rapid deterioration of the dam documented by USBR during the summer of 1992, Congress approved a "fast track" construction schedule for Como Lake. Construction began in August 1992 and is scheduled for completion in November 1993. All construction will be conducive to an increase in dam height until the fall of 1993. At that time funding must be available for the increase, or the spillway will be placed at a lower elevation, making it prohibitively expensive to accommodate a future increase in height.

The Bitterroot Resource Conservation and Development, Inc. (RC&D) is coordinating fund raising and community support. The RC&D has been successfully implementing natural resource projects for 30 years. Our Congressmen have all agreed to support legislation that would provide the USBR with $3 million for the project. Now, we must show them we can raise the other $2 million. Appropriating $300,000 in Montana Reclamation and Development Grant funds would help support the federal appropriation and would make Montana a viable partner in the project. All Montanans will benefit from the improvement in the quality of our public waters, as will downstream states, such as Idaho.

TECHNICAL ASSESSMENT (Prepared by DNRC)

The problems are well defined in this application: poor water quality in the Clark Fork River, low flows during critical periods, low recreation pool in Como Lake at the end of the irrigation season, and irrigation water shortages one out of five years. The technical data provided do support some need and urgency for this project. The effects on Rock Creek after it flows out of Como Lake, which appear to be an important benefit, were not mentioned in the application. Past efforts to supply water for fisheries from Painted Rocks Reservoir, a state-owned project on the West Fork Bitterroot River, were discussed; however, the success of these efforts was not evaluated.

The methods for accomplishing the project objectives are not completely outlined, so the likelihood of success cannot be fully evaluated. Detail is needed on specific tasks that would be carried out by the RC&D and on funds disbursement responsibility and plans, coordination with interest groups, technical plan review and approval, and management plans for the retention and/or release of the additional 8,200 acre-feet of water. A management plan for use of the additional water, which is essential for project benefits

to be realized, is lacking from the application. Water rights have not yet been obtained, which must be done before construction begins.

This is a dynamic project in that the design, construction schedule, and budget have undergone various revisions since the project's inception. It is possible that other design and funding alternatives will develop that the applicant could pursue. Any current alternatives are so likely to change that they are not discussed here.

FINANCIAL ASSESSMENT

The RDGP budget request is shown below.

Salaries and wages	$ 1,200
Employee benefits	$ 300
Contracted services	$ 298,500
TOTAL	$ 300,000

Should the legislature decide to fund this project, it is important to note that a commitment for funding is needed before the spillway is constructed. Spillway construction is currently scheduled by the USBR for the fall of 1993. If there is not enough funding to raise the dam, the bureau will install a smaller spillway.

The Bureau of Reclamation's $5 million cost is a gross estimate, but, until conceptual designs for the enlargement are developed, no better cost estimate is available. The $5 million estimate includes the cost of installing a larger spillway. The estimate minus the cost of enlarging the spillway is $2.5 to $3 million. The applicant states that, if it has to pay the cost of enlarging the spillway, pursuing this project would no longer be economically feasible for it.

ENVIRONMENTAL EVALUATION

The Bureau of Reclamation did an environmental assessment on the safety modifications. Within this assessment, the enlargement proposal was evaluated. Essentially, most impacts would be along the lake perimeter where the enlargement would flood an additional 34 acres of land. Most of the acreage that would be flooded occurs in the flatter area at the upper end of the lake. The U.S. Fish and Wildlife Service estimates that, after the raise in elevation of the lake, there would be a net loss of eight acres of wetlands. Some wildlife would therefore be permanently displaced. The additional water would be expected to increase fish availability in the lake only marginally, and fish would continue to exhibit slow growth. The lower portion of a series of cascades at the head of the lake would be inundated during high water.

During construction, there would be some short-term negative effects on water quality and fisheries due to increased sedimentation. Noise and air quality impacts are also anticipated in the short-term. Mitigation methods do exist that would reduce these impacts.

PUBLIC BENEFITS ASSESSMENT

The applicant has provided estimates of some of the benefits of the project. However, not all of the benefits have been calculated.

The project sponsor estimated the recreation benefits to be $4 million. DFWP calculated this value to be $1,541,740. The project's goals of increasing the recreation pool and providing additional irrigation water appear to be achievable. However, one technical reviewer maintained that significant recreational benefits would not be gained. It was that reviewer's opinion that deep-draft storage reservoirs are not ideal recreational sites because of fluctuating water levels, difficulties with boat access, poor visual quality, and unstable fisheries.

The benefits of an additional 1,367 acre-feet of irrigation water from the project were estimated to be $100,000. This estimate appears to be reasonable.

The economic benefits of the improved fishery are not quantified. However, this could be done by estimating the additional angler days and calculating their dollar value using figures found in the *Angler Preference Study Final Economics Report*, 1988, DFWP.

DFWP has communicated to the applicant that a total flow of 400 to 450 cfs is necessary to provide a quality fishery in the Bitterroot River. The applicant does not definitively state that the additional 8,200 acre-feet of water from this project would add enough water to produce a total flow of 400 to 450 cfs in the Bitterroot River. Without effective water monitoring and management, the anticipated water quality and fisheries benefits associated with the proposal would be uncertain.

Benefits to clean water, quality of life, etc., are not quantified in the application but are real. According to DFWP, although the economic benefits quantified in the application do not exceed the costs of raising the dam, the unreported benefits would more than likely make the cost/benefit ratio positive.

However, it is not clear if the goal of improving water quality and fisheries would be attainable. According to the DHES Water Quality Bureau, a 10 percent increase in July

and August flows in the Bitterroot River would improve water quality in the Clark Fork. The applicant does not state that the additional water provided by this project would increase July and August flows by the needed 10 percent.

According to the Water Quality Bureau, to achieve improved water quality benefits would require that assurances be made that additional water storage capacity be used for streamflow augmentation. An on-site water commissioner would be needed to ensure that late season water releases remain instream and are not diverted by downstream users. Additionally, the timing and volume of releases to enhance instream flows would be critical. Close monitoring would be required to ensure there is adequate storage in Como Lake and that the stored water is reserved for the most critical periods.

RECOMMENDATION

A grant of up to $300,000 is recommended, subject to the following contingencies.

1. DNRC must approve the project scope of work and budget.

2. Water rights must be secured for the additional water to be stored by this project.

APPLICANT NAME : Butte-Silver Bow

PROJECT/ACTIVITY NAME : Mitigation of Mining and Smelting Damage through Urban Forestry

AMOUNT REQUESTED : $ 150,000

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor	$ 24,000
Landscape Architect (In-Kind)	$ 3,000
Volunteers (In-Kind Services)	$ 3,000
Donations	$ 1,000

TOTAL PROJECT COST : $ 181,000

PROJECT ABSTRACT (Prepared and submitted by applicant)

The overwhelming air pollution associated with early mining and smelting destroyed native vegetation in Butte and prevented ornamental planting. In addition, by 1882,

mining companies were hauling timber off the foothills at an estimated rate of over 200,000 trees per month for mining-related purposes. Most of the vegetation in the community was decimated.

Therefore, Butte, unlike most cities, did not develop an urban forestry program. To offset the bleakness of the town and give Butte residents an oasis complete with trees, shrubs, flowers, and other plantings that were lacking in the city, William Clark built the Columbia Gardens at the turn of the century. Until 1973, this beautiful area gave Butte's citizens a place to relax and play. In 1973, the Columbia Gardens gave way to mining, and, where trees and playgrounds once stood, there remains only the bare soil disturbed by mining operations.

Butte-Silver Bow's number one priority is to diversify and expand its economy. However, urban blight due to past mining has been documented as one of the major barriers to economic development. When one also adds the environmental and social costs associated with the lack of street trees, the need for a major program to rectify the damages done to this resource by past mining and smelting activities becomes apparent. Therefore, remedial action is necessary.

Numerous federal, state, and local reports have concluded that an aggressive urban forestry program is an important part of any urban enhancement program for Butte. To meet this need, Butte-Silver Bow developed an Urban Forestry Program with the assistance of a 1987 DNRC Resource Indemnity Trust Fund Grant. Although the Urban Forestry Program, which is entering its fourth season, addresses the technical, social, and long-term funding requirements beyond the initial grant request, the scope of the existing reclamation work in Butte-Silver Bow burdens the program's resources. Additional reclamation work not outlined in the initial grant still remains a priority in the community--namely, visual enhancement of the gateways, parkways, and parks.

The proposed three-year project, if implemented, would have an immediate impact on the city and citizens of Butte. It would become an important part of the total Urban Enhancement Program and would continue reducing the impact of past mining and smelting activities on Butte and its citizens.

TECHNICAL ASSESSMENT (Prepared by DNRC)

Over a three-year period, the Butte-Silver Bow Friends of the Urban Forest plan to plant over 360 trees along approximately five miles of roadway. Selected areas to be planted with trees and shrubs are two "gateways" adjacent to Interstate 90--the Montana Street exit and the City Center/Iron Street exit. Ornamental street tree plantings would be placed along three main thoroughfares (north/south connector streets)--Montana Street, Main Street, and Utah Street from Front Street north to Granite Street. Coniferous trees and various shrubs would be planted along Continental Drive from Texas Avenue to Park Street to screen active and unreclaimed mine areas.

The Butte-Silver Bow Friends of the Urban Forest program has been ongoing since 1989. The Friends of the Urban Forest is made up of five local concerned citizens. They have received input on the design of their program from the County Extension Agent, U.S. Forest Service, Montana Department of State Lands Forestry Division, and a local landscape architect. The program has planted over 350 trees since its inception. Butte-Silver Bow has evidenced the ability to carry out a successful urban forestry program. The Friends of the Urban Forest has demonstrated that it has the organization, support, and technical expertise to carry out this project successfully.

Water is the most limiting factor in a successful urban planting program. Unfortunately, a number of state and federal grants for urban forestry limit funding to the purchase and planting of nursery stock. Without a well-developed watering maintenance program, trees in downtown urban settings do not fair well. As an example, the City of Great Falls has two watering trucks out all summer, 40 hours a week, watering the six-hundred-plus trees the city plants every year. Great Falls also has an approximate $400,000 per year forestry budget. Cities that do not have this type of internal funding source for tree watering must try to incorporate automatic watering systems into their plantings. The Butte-Silver Bow program should incorporate a tree watering/maintenance plan involving irrigation system installation and/or manual watering using trucks or other methods.

The 1991 Federal Highway Bill has given the Montana Department of Transportation $5 million every year for the next five years for highway enhancement programs. Of this amount, Butte-Silver Bow will receive $150,000 for a broad range of projects. The Friends of the Urban Forest should request funds from this source for the Interstate 90 interchange plantings. The request for funding should include planting stock, the cost of planting, and the installation of an irrigation system.

FINANCIAL ASSESSMENT

The RDGP budget is shown below.

Salaries and wages	$ 19,208
Employee benefits	$ 7,792
Supplies and materials	$ 105,500
Communications	$ 1,000
Travel	$ 500
Equipment	$ 15,000
Miscellaneous	$ 1,000
TOTAL	$ 150,000

The main expense is $97,500 for trees, shrubs, and ground cover under the supplies and materials category. Also under this category are $7,500 for supplies and $500 for training materials. Under the equipment category $15,000 is budgeted for rental of equipment to break concrete, dig holes, haul trees, and irrigate.

Butte-Silver Bow charges property owners $120 per tree, which includes planting and replacement. Based on the total RDGP request of $150,000 to plant 360 trees, the average cost per tree would be $416.67. This figure does not include any local match from individuals or businesses to have trees planted in the boulevard in front of homes or businesses. The average cost of contracting out the purchase and planting of a tree two and one-half inches in diameter should rarely exceed $250 per tree. Adding the overhead cost of designing and administering the project (approximately 20 percent), a total project cost of $108,000 would be more realistic. Contracting out the planting of trees would reduce the cost of the project. The funds saved could be redirected to incorporate a tree watering/maintenance plan as recommended in the Technical Assessment.

ENVIRONMENTAL EVALUATION

This project should not cause any major adverse environmental problems. Plans must be developed for handling and disposing of toxic wastes, if any are encountered. Also, testing should be done to ensure that topsoil used in tree planting is not contaminated.

The major positive environmental effects would be improved urban forests and aesthetics for the community. The trees would reduce street dust and air pollution. The presence of small metal particulates in street dust is a health hazard to Butte residents. Reduced noise pollution and erosion would also result. The increase in trees along Butte streets would provide habitat for birds and urban wildlife.

PUBLIC BENEFITS ASSESSMENT

This project would reclaim or screen from view areas that historically had trees but were denuded due to mining and smelter operations and resultant pollution. The benefits of this project would be long-term, provided that the trees survive. Residents of the Butte area would be the main beneficiaries of this project. This project would involve a few jobs for persons planting and caring for the trees and administering the project.

Potentially there could be an increase in jobs due to increased tourism and new businesses locating in Butte; however, this is somewhat speculative and depends on other factors as well.

In 1987 the Butte-Silver Bow urban forestry project ranked low, 25 out of the 27 projects approved for RDGP funding. The RDGP program continues to encourage communities to appropriate local funds or seek other outside funding sources for urban forestry projects.

RECOMMENDATION

A grant of up to $150,000 is recommended for this project with the following contingencies.

1. DNRC must approve the project scope of work and budget.

2. Butte-Silver Bow must contract out the planting of the trees to reduce costs. DSL has offered assistance to develop tighter bid documents to minimize the cost of materials and installations.

3. Butte-Silver Bow must develop and incorporate a plan for maintenance of the trees to include regular watering or the installation of automatic watering systems.

4. Butte-Silver Bow must revise the scope of work to concentrate plantings in areas that have been affected by past mining and should obtain funding for the Interstate 90 interchange areas from the Montana Department of Transportation or other sources. Alternative planting areas would need to be identified for the trees now planned for the highway interchange areas, or the grant would be reduced accordingly.

APPLICANT NAME : Town of Hot Springs

PROJECT/ACTIVITY NAME : Camas Therapy Center

AMOUNT REQUESTED : $ 300,000

OTHER FUNDING SOURCES AND AMOUNTS :

Private	$ 50,000
Montana Department of Commerce (Community Development Block Grant)	$ 300,000
Economic Development Administration	$ 900,000
Farmers Home Administration (Loan)	$ 250,000
Small Business Administration (Loan)	$ 250,000

TOTAL PROJECT COST : $ 2,050,000

PROJECT ABSTRACT (Prepared and submitted by applicant)

The hot mineral waters, flowing from the springs adjacent to the Town of Hot Springs, will be used for the healing of the medical and economic ills of the community and surrounding areas.

The Town of Hot Springs, in cooperation with CAM Redevelopment Corporation, will rebuild the abandoned tribal bathhouse into a modern therapy center. In doing so, the town will provide a healing center in an area of the state where medical care, and especially physical therapy, is not currently available. This center, currently leased from the Confederated Salish and Kootenai Tribes by CAM, will in turn provide over 100 direct and indirect employment opportunities in an area hit hard by unemployment. (State of Montana Job Service figures show percentages ranging from 14.8 to 25.1.)

At the present time, in excess of 590 gallons per minute (gpm) of hot mineral water is flowing over the bank into a ditch. This water is seen as a wasted natural resource which should be conserved and protected. The applicant's plan is to capture this water and use it for hot water therapy. The heat from the wells, already in place, will also be used to provide the environmental control system for the building itself, which was once

heated with oil. The recyclable water created by the therapy center will be used in irrigating the surrounding public park and adjacent golf course.

Before the bathhouse properties were closed in the early 1980s, they served persons from the United States, Canada, and 17 other foreign countries. In their prime, they served an average of 150 persons a day. According to the feasibility study conducted by AdScripts of Missoula in 1991, there is no reason to believe that an even better success ratio could not be achieved.

This project has received unanimous support from city, county, tribal, state, and federal government officials. The applicant has worked hand in hand with the Confederated and Salish Kootenai Tribal Council and developed plans in cooperation with their cultural committees. This approach is leading to greater understanding between tribal and nontribal persons on this reservation.

This retirement community of under 500 persons has raised over $10,000 to be used for matching funds and operation of CAM Redevelopment, a nonprofit corporation formed by leaders of the community to address economic reversals in the area. The local Swimming Pool Fund has pledged over $50,000 to be used for matching funds. The applicant continues to work closely with the Economic Development Administration (EDA), which funded a technical assistance grant for the feasibility study. The applicant has approached EDA as a source of matching funding through its Public Works Program.

The combined funding and construction phases of this project are projected to take 12 to 24 months. The Town of Hot Springs will oversee all grants and control all funds. The mayor will be on the management board.

TECHNICAL ASSESSMENT (Prepared by DNRC)

The Town of Hot Springs has sought avenues for local economic development since closure of the Tribal Bathhouse in 1985, transfer of Bonneville Power Administration personnel from Hot Springs to Kalispell in 1990, and closure of area lumber mills. A feasibility study was conducted with grant money from the Economic Development Administration to help determine whether revival of the resort is the best alternative for revitalizing the economy of the area. Conclusions of the study indicated that resort renovation was consistent with community goals and was advisable and viable, with certain qualifications. These centered on resolution of a water allocation issue with an adjacent leaseholder and the continued willingness of the Tribal Council and the community of Hot Springs to work together. The water allocation issue has been resolved by issuance of a revocable water permit for 39,600 gallons per day (GPD), or 27.5 gallons per minute, to be used by CAM Redevelopment Corporation for the therapy center. Annexation of the bathhouse grounds by the Town of Hot Springs is still being pursued.

Supporting studies for resort renovation include an architectural feasibility study, a preliminary engineering report, and a geothermal investigation of the Camas Hot Springs area. The architectural study provides a reasonable proposal for renovation of the bathhouse and grounds. However, the geothermal investigation does not adequately address the long-term sustainability of bathhouse wells, impacts to the reservoir's storage volume or temperature following development, or impacts to nearby existing wells and springs. From this study, it is not possible to determine if geothermal development, without adequate long-term testing, would degrade the springs' geothermal qualities and/or flow rate. Current flow rates appear adequate to support heating needs for the swimming pool, uses of the bathhouse, and partial heating of the building. More analysis and design should be completed before a heating system is selected to verify that the geothermal water would not have adverse effects on heating and plumbing systems.

Priority needs for project development are removal of one underground and one above-ground oil tank located next to the bathhouse, which pose a threat to the integrity of the aquifer, and removal of asbestos. Asbestos is known to occur on outdoor siding and on water pipes and boilers in the building, and it may occur elsewhere. Tribal support for removal of the underground tank has been documented. Some portions of the building will need to be demolished because of hazardous conditions. Funds also are requested for renovation and construction of the facility.

FINANCIAL ASSESSMENT

The budget is reasonably clear and complete. Estimates for asbestos removal are based on an educated guess by the architect, which appears to be reasonable. Matching funds of $50,000 have been secured; however, the applicant is seeking an additional $1,700,000 in economic development grants and FHA and Small Business Association loans.

CAM Redevelopment has initiated preapplication consultation with the Montana Department of Commerce's Community Development Block Grant staff and with the Economic Development Administration of the U.S. Department of Commerce. Documentation for consultation with the FHA and SBA was not provided.

ENVIRONMENTAL EVALUATION

Renovation of the bathhouse and grounds would not result in significant impacts. Construction-related demolition and disturbance would be limited to the site itself.

Obtaining permits would be necessary for underground tank removal, spring renovation, and building renovation and construction. EPA guidelines would have to be followed for asbestos removal and disposal. Further geotechnical investigation will be necessary to demonstrate that the proposed development would not adversely affect the aquifer and other domestic water supplies.

Long-term positive benefits would accrue to the community of Hot Springs through creation of jobs and increased community income. A potential threat to an underground aquifer would be removed.

PUBLIC BENEFITS ASSESSMENT

The proposed project would result in the development and use of Camas Hot Springs. A tangible benefit--renovation of the bathhouse and grounds that are currently abandoned and in disrepair--would result for the citizens of Montana and for the Confederated Salish and Kootenai Tribes. The completed project would support economic development activities for the Town of Hot Springs. An estimated 14 new jobs would be created at the therapy center and potentially 70 to 100 new jobs in the community of Hot Springs. The primary beneficiary would be the Town of Hot Springs.

The physical environment would benefit by the removal of an underground storage tank that may now or in the future leak and contaminate the aquifer.

RECOMMENDATIONS

A grant of up to $150,000, which is one-half the requested amount, is recommended for this project, subject to the following contingencies.

1. DNRC must approve the scope of work and budget.

2. RDGP funds shall not be used for asbestos or tank removal; the applicant must secure these funds elsewhere.

3. Written support for the entire project must be obtained from the tribe and the adjacent leaseholder.

4. A geohydrological investigation must be conducted, and it must conclude that (1) area aquifers will not be adversely impacted by the project, and (2) sufficient flows are available to sustain the facility in the long term.

5. The lease agreement and water allocation permit must be acceptable to all funding sources, and documentation of such acceptance must be furnished to DNRC.

6. The applicant must furnish to DNRC firm funding commitments from all funding sources (other than RDGP) for the total project cost ($2,050,000).

The following projects are not recommended for funding. The list is alphabetized by the name of the project sponsor.

APPLICANT NAME : Butte-Silver Bow

PROJECT/ACTIVITY NAME : Development of a Mine Subsidence Insurance Program

AMOUNT REQUESTED : $ 123,750

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor $ 8,880

TOTAL PROJECT COST : $ 132,630

PROJECT ABSTRACT (Prepared and submitted by applicant)

The overall objective of this project is to develop a sound basis for initiating a self-sustaining hard-rock mining subsidence insurance program in Montana. The general approach of the proposed project involves specific research and development and regulatory evaluation phases conducted by the Butte-Silver Bow government in an effort closely coordinated with the Montana Department of State Lands. A state-administered subsidence insurance program will be developed for the Central Butte Subsidence Area south of and adjacent to the central business district. The proposed project will develop the framework, regulatory and technical criteria, and administrative and financial requirements and procedures necessary for successfully implementing a program to insure property against damages caused by land subsidence resulting from mining.

The long-term goal of these efforts is that insurance against damage caused by hard-rock mining be handled by the private insurance industry following guidelines established by the Montana Legislature. This project will develop the information needed to establish the legislative guidelines and implement this much needed program.

TECHNICAL ASSESSMENT (Prepared by DNRC)

The project sponsor argues that a mine subsidence insurance program would alleviate deterioration of the Central Butte Mine Subsidence Area, because adequate insurance against damage from land subsidence would eliminate restrictions and concerns by lenders about funding proposed redevelopment projects. The program could be expanded to address similarly impacted areas throughout Montana.

Four alternatives are discussed in the application, including the proposed plan. Because details analyzing the cost, scheduling requirements, and options of local residents or businesses are not provided for each alternative, it is difficult to adequately analyze the selection of the proposed project as the preferred alternative. Each of the alternatives discussed in the application demonstrates merit in solving at least a portion of the problems identified with the deterioration of properties in the central Butte area. It would appear that a land use study of the central Butte area in the context of continual adverse effects from land subsidence would benefit the process, allowing for the complete identification of available alternatives and the selection of the best course of action.

The structure of the proposed program has not been defined, and information about the success of similar programs in other states is not provided. It is therefore impossible to determine whether the proposed program will solve the problems identified with mining subsidence in the central Butte area. The funding requested would apparently be used to finance a study that would lead to the design of an insurance program; however, the mechanism by which the insurance program would provide protection for respective lenders from property damage to their investments resulting from land subsidence is not described.

Because the central Butte area is included in the Butte Superfund Site, lending restrictions may continue until EPA opinions are more clearly identified concerning the specific liability of property owners encompassed in a Superfund site.

Technical information defining the best use of land in the central Butte area in the context of continual adverse impacts due to land subsidence is not provided or discussed. Before redevelopment of the area is proposed and stimulated through implementation of a state funded insurance program, it would be prudent to determine the most desirable land use of the area.

Finally, the grant application does not discuss questions regarding the selection of a mining subsidence insurance program as the best remedial action for addressing deterioration of structures in the central Butte area. The magnitude of continual mining subsidence in the area is not discussed in detail; thus, the adverse impact of subsidence on redevelopment and purchase of properties in the area cannot be determined. In the event that mining subsidence will continue to generate widespread destruction of

structures in the central Butte area, then perhaps a different land use such as an open space area would be more sensible alternative.

FINANCIAL ASSESSMENT

Butte-Silver Bow intends to use the RDGP funds ($123,750) to hire a consultant and contract with the Department of State Lands (DSL) to perform the proposed tasks. The selected consultant would conduct a literature search and use this information to develop a plan for program implementation. A complete analysis of the project budget is impossible because details involving implementation of the project are not provided. The method of implementation of the proposed mining subsidence insurance program and its ability to provide adequate funding for redevelopment of the central Butte area are not discussed in the application. The grant application mentions the success of similar programs in other states, but provides no explanation of that success or how those programs are implemented and structured. The level of concern of lenders about providing funding for properties included in a federal Superfund site is not recognized or discussed; thus, it is difficult to analyze the potential of this program to create a healthy lending attitude for future redevelopment and purchasing of properties in the central Butte area. Inquiries to DSL regarding its involvement indicate DSL does not support the project as proposed.

ENVIRONMENTAL EVALUATION

The project will have no direct effect on the environment. If the project is successfully implemented, the program could have an impact on the human environment, e.g., community and personal income, tax base, housing quantity and distribution, demand on government services, etc. However, until the program is better defined and implemented, these impacts are impossible to assess.

Long-term adverse impacts may continue in the central Butte area as a result of continual land subsidence throughout significant portions of the area. The magnitude of the adverse impacts on structures involved in future development projects in the area will depend on the extent of the projects and their success in avoiding areas impacted by continued land subsidence.

Short-term environmental impacts are not considered a problem.

PUBLIC BENEFITS ASSESSMENT

The applicant lists the elimination of urban blight and deterioration within the central Butte subsidence area and associated neighborhoods as the most important public benefit. The likelihood of attaining this benefit as a result of this project, as proposed, seems small.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME : Crow Tribe

PROJECT/ACTIVITY NAME : Lodge Grass School--Coal Mine and Gravel Pit Reclamation

AMOUNT REQUESTED : $ 299,090

OTHER FUNDING SOURCES AND AMOUNTS :

None

TOTAL PROJECT COST : $ 299,090

PROJECT ABSTRACT (Prepared and submitted by applicant)

This project involves the reclamation of lands owned by Lodge Grass School District and located near the Lodge Grass Public School within the Town limits of Lodge Grass. A portion of the property (as well as adjacent private property) contains an abandoned gravel pit and abandoned underground coal mine identified as the Lodge Grass Mine. The coal mine was closed in 1921 and the mine openings sealed after the death of a miner and a local teenager. The extent of mine adits and drifts are unknown, but they are assumed to extend to, and possibly underneath, the Lodge Grass Public School building.

Located atop the underground mine is a gravel pit which has had excavations occurring since about 1930. Most of the gravel has been removed with no efforts to reclaim the pit.

The mine adits are not identified and need to be located and mapped. Although subsidence is not currently a problem, future subsidence is imminent and could jeopardize existing structures. The ±5-acre surface disturbance needs to be regraded, with slopes stabilized and revegetated to eliminate environmental concerns. The mine adits need to be backfilled to prevent subsidence. A fence needs to be constructed to control access. The following project phases, objectives, and dates are desired.

Phase I : Construct a permanent chain link fence along the west side of the disturbed area, and provide a sidewalk and crosswalk with appropriate school signage. Complete in July and August 1993.

Phase II : Complete environmental assessment, exploratory drilling, and design plans and specifications of the reclamation area. Complete during August through October 1993.

Phase III : Complete reclamation work. Complete during the period from March 1994 through October 1994.

The coal mine and gravel pit are submitted under the "crucial state need" category due to the potential threat to public health and safety. There were two deaths prior to 1921 directly resulting from the mine area. On April 30, 1992, another nearly fatal accident occurred as an indirect result of the area. The problem arises from the daily occurrence of school children playing in the gravel pit and mine area. Children dart back and forth across a busy highway going to and from the adjacent school and housing area. The highway is congested with automobiles traveling at excessive speeds. A blind hill causes poor sight distance. Eight traffic accidents in the vicinity have occurred since December 1989, resulting in two injuries.

TECHNICAL ASSESSMENT (Prepared by DNRC)

The applicant's argument for the proposed design is not convincing. Discussion is needed that includes analysis and comparison of alternatives other than the one proposed. A preferred approach would be for the tribe to re-examine the need for intensive labor of the scale proposed, the unit prices of heavy equipment usage on this type of project, and the need for, design of, and costs of the proposed drilling program. The scale and complexity of the proposed work appear out of balance with the funding request, resulting in reviewer concern with project cost-effectiveness.

FINANCIAL ASSESSMENT

The proposal lacks sufficient technical detail to assess the implementation plan adequately.

For instance, additional detail is necessary to evaluate the Phase I fencing, sidewalk, and school safety signage. It is not clear why roughly 1,070 man-hours (Crow Tribe) would be needed to construct a 1,000-foot fence and 40-cubic-yard sidewalk. This phase would also include two vehicles for 30 days travel at a cost of $1,080, which is excessive. No alternatives are discussed.

Phase II, would include $53,110 for an exploratory drilling program to locate purported underground mine voids. A previous OSM drilling program is briefly mentioned and would assist in evaluating the need for the proposed drilling, noting any conclusions or recommendations for follow-up work. Because this phase would mostly be done by contracted services, the need for 430 hours (salaries and wages Crow Tribe) is unclear. No alternatives are discussed.

Phase III would consist of regrading, revegetating, and fencing and include 27 Crow Tribe laborers' salaries and benefits ($125,077.05), inspection ($12,133), travel ($3,960), supplies ($3,651), rent ($3,080), and bulldozer work ($52,500). This work could be done by heavy equipment at considerably less cost.

Based on the labor, material, and equipment costs of similar projects conducted by the Department of State Lands, DNRC, Department of Health and Environmental Sciences, and others, it is hard to justify the project's expense. The amount of RDG funds requested does not seem warranted for the level of work proposed.

ENVIRONMENTAL EVALUATION

The proposed project would have short-term impacts on the environment, primarily those associated with noise, dust, and emissions from heavy equipment operation. No other adverse impact is predicted on the air, soil, water, or vegetative resources. There may be some disruption of local traffic patterns during construction. No long-term adverse impacts are foreseen. Some uncertainty exists over the extent of underground adits and the potential they have for subsiding. A cultural inventory is planned by the tribe, as well as an environmental assessment before work commences.

PUBLIC BENEFITS ASSESSMENT

The primary benefits associated with this project would be the elimination of a potential safety hazard by fencing and grading of the site and the injection of dollars into the distressed local economy.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME : Gallatin County Road and Bridge Department

PROJECT/ACTIVITY NAME : West Gallatin River--Flood Control

AMOUNT REQUESTED : $ 300,000

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor $ 24,360

TOTAL PROJECT COST : $ 324,360

PROJECT ABSTRACT (Prepared and submitted by applicant)

This twofold plan consists of (1) conducting a comprehensive engineering study of the West Gallatin River (in Gallatin County) to determine the best design criteria whereby a "stable" channel flow may be attained, and (2) thereafter prioritizing and implementing the proposed construction plans. The result of this long-term plan will be correction and maintenance of many areas along the river that in the past have been repeatedly subject to flooding and have the potential to seriously endanger public and private roads, bridges, agricultural lands, private homes, and human life.

The "action plan" encompasses 45.2 miles of the West Gallatin River, which over the last 20 years has undergone drastic westerly channel alterations. The last floodplain study of the river was conducted in 1972. Presently, there are 124 permanent homes in this study area. The land use is agricultural, divided as follows: 75 percent - pasture ground, and 25 percent cultivated ground. Twelve major and several small canals have their headgates in this area, and each has the potential of becoming a tributary to the West Gallatin if a high discharge situation were to occur. Overflow channels along the West

Gallatin that flow directly into Baker Creek are a very high priority area under this plan. During 1991, massive erosion occurred at the head of these overflow channels, causing loss of the natural protection afforded by previously higher-elevated stream banks. Due to this, Baker Creek more than likely will become a major tributary to the West Gallatin River, causing severe flooding outside of the 100-year floodplain.

Land values along the West Gallatin are approximately $1,000.00 per acre. An average home value is $80,000.00. These figures were obtained from the Gallatin County Appraisal Office. It is clear, when taking into consideration 45.2 miles of waterway, that this is an area of considerable investment.

County roads and bridges will also be affected by this project, including four bridges with spans in excess of 100 feet, eight bridges with spans in excess of 20 feet, and 16 miles of roadway. Bridge replacement costs are $1,500.00 per foot. These roads and bridges have sustained damage in the past and remain in jeopardy due to the channel flow changes. The deprivation caused by flooding would certainly reach mammoth proportions in terms of monetary loss alone. And, obviously, one cannot place a value on damage to the natural environment or, more importantly, loss of human life.

TECHNICAL ASSESSMENT (Prepared by DNRC)

The applicant is proposing to use the grant money to design and install flood control structures. Traditionally, these types of structures are very expensive, and it is likely that the amount of funds requested will not be enough to carry out recommendations made by an engineering study. In addition, structural flood control projects tend to encourage new development in floodplain areas.

The applicant shows no evidence of researching alternatives to achieve the stated goals. Several alternative methods to prevent flood damage could be explored. Some examples are listed below.

1. Floodplain regulations could be strengthened to prevent further encroachment onto the floodplain and protect development from flood damage. For example, the 500-year floodplain could be regulated, or new development could be restricted from the 100-year floodplain. Preventing further encroachment onto the floodplain would help avoid increased risk to structures, roads, and bridges. Areas outside the floodplain that are considered high hazard because of the possibility of banks failing and sloughing into the river could be restricted from future development.

2. The cost-effectiveness of a "buy-out" program could be researched, compared to that of structural alternatives. In a "buy-out" program, structures at high risk from flood damage (such as those homes threatened by bank failure during a flooding event) are targeted, and offers are made to buy the homes or relocate them away from flood danger.

3. A "retrofit" program could be researched for cost-effectiveness. Under such a program financial assistance would be offered to protect individual homes structurally from flood damage through such means as building floodwalls or elevating the home.

The applicant should consider following the steps listed below in developing a flood hazard mitigation plan and searching for appropriate funding sources for the West Gallatin drainage.

1. The applicant should first (perhaps with the help of a consultant) assess the risks in the West Gallatin River drainage. This should include the number of lives potentially threatened and the number, location, type, and value of structures at risk. The assessment should include an inventory of the structures in the floodway, floodway fringe, 100-year floodplain, and 500-year floodplain. Next, a consultant could be hired to develop a flood hazard mitigation plan exploring the full range of nonstructural and structural options to reduce the flood hazard. The applicant, with the aid of the consultant, could then search for appropriate funding sources and apply for money for the mitigation measures and for any construction. A fairly detailed scope of work could be presented in the grant application with a detailed breakdown of costs. This would require payment of consultant costs by the applicant.

2. The applicant could consider developing two separate proposals. The first proposal would be to hire a consultant to formulate a detailed risk assessment and flood hazard mitigation plan. Once the plan is completed, the consultant could assist with the preparation of a detailed application for mitigation and construction work to be submitted to appropriate funding sources. This approach would save the applicant the cost of hiring a consultant with their own funds but would require a greater length of time to accomplish project results.

In planning this project, the Road and Bridge Department should closely coordinate with other agencies, such as the U.S. Army Corps of Engineers, state and local Disaster and Emergency Services, Federal Emergency Management Agency, irrigation districts, Burlington Northern Railroad, the Gallatin Conservation District, the local Floodplain Administration, and the state Floodplain Management Section.

FINANCIAL ASSESSMENT

The budget consists of a lump sum figure of $122,040 for contracted services for the engineering study. Evidently, the remaining $177,960 of the $300,000 requested is for construction costs. The budget is based on rough total estimates provided by two engineering consultant firms and a "low side estimate" for construction by the U.S. Army Corps of Engineers. The total budget is the sum of the lowest quotes for contracted services and construction. A cost breakdown is needed.

The budget narrative states that, taking the low estimates into consideration, engineering and construction costs for the three high priority areas would exceed $279,000. It is most likely that the funds requested would not be adequate to complete the project.

ENVIRONMENTAL EVALUATION

Until a flood control study is completed, the structures that would be installed and, specifically, the impact to the environment are unknown. In general, flood control structures typically used, such as riprap, rock drop structures, rock jetties, dikes, levees, diversion structures, or floodwalls, can have a significant impact on water quality, fish, and wildlife. According to DFWP, this project, if implemented as described, could eliminate wetlands and wildlife habitat. Also, flood control structures tend to encourage development in floodplain areas, which could further threaten wetlands and wildlife habitat. Required permits would need to be obtained prior to any structural changes in the floodplain. Proper coordination and review by permitting agencies can lessen impacts and provide for mitigation of lost resources.

A short-term environmental impact would be some temporary turbidity during construction. This could be mitigated in several ways and commonly is treated with silt fences or other particle barriers.

PUBLIC BENEFITS ASSESSMENT

The applicant states that 124 residences are in the project area. The main beneficiaries, who are the residents in the floodplain, have submitted letters of support for this project. Further assessment of public support could be obtained by holding public meetings and polling landowners.

Some temporary jobs would be created during the construction phase of this project.

Statewide benefits would result from decreased amounts of disaster assistance in the event of a flood. However, this benefit cannot be quantified with the data provided in the application. Information from the applicant on the property value of structures in the floodway (the highest risk area), 100-year floodplain, and 500-year floodplain and on total project cost would facilitate a cost/benefit analysis of the project. Without this information, it is difficult to justify the need and urgency and evaluate the benefits for this project.

This application received a low ranking mainly because of technical deficiencies and the applicant's failure to properly assess and document public benefits. The Montana Disaster and Emergency Services Division does not consider this stretch of the Gallatin River to be more dangerous than others. The applicant must demonstrate that the project is a crucial state need under RDGP criteria before it can be considered for a higher ranking.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME : Montana Department of State Lands/Hard Rock Bureau

PROJECT/ACTIVITY NAME : Expansion of the Geographic Information System of the Department of State Lands

AMOUNT REQUESTED : $ 119,488

OTHER FUNDING SOURCES AND AMOUNTS : None

TOTAL PROJECT COST : $ 119,488

PROJECT ABSTRACT (Prepared and submitted by applicant)

A Geographic Information System (GIS) would assist the Hard Rock Bureau in evaluating mine proposals, estimating bonds, inspecting mines, and determining compliance with Montana's air, water, and reclamation laws. A GIS integrates mapped geographic features (such as land ownership boundaries, differences in vegetation types, and land uses) with specific data about those features (such as land management practices, vegetation densities, and water quality). The GIS would provide the ability to query, manipulate, and analyze those data. Funding is needed for two years until legislative appropriations can be made to extend the program. Costs to fill a Grade 14 position, hardware, hardware maintenance, software, software updates, communications, and travel are $119,488. The new GIS would be integrated with the Coal and Uranium Bureau's GIS, and the statewide GIS coordination effort would be enhanced by the combined efforts of the bureaus. Potential hazards or deficiencies in proposed mining operations and reclamation plans would be more clearly identified with the advanced data analysis capability of the system, thus serving the public and enabling the State of Montana to better protect and manage its natural resources. Annual reports would be submitted to document work facilitated by use of the system.

TECHNICAL ASSESSMENT (Prepared by DNRC)

The application does not clearly state how the proposed project would enhance the ability of the Department of State Lands (DSL) to evaluate applications for mines, estimate bonds, inspect mines, and determine compliance with state air, water, and reclamation laws. A description of current facilities and methods and how a GIS would improve their output is lacking. The application does not clearly state for which projects the new system would be used. Instead, DSL management would identify and prioritize prospective projects for integration into the GIS. At this time, specific projects under consideration include the McDonald Meadows/Keep Cool exploration plan evaluation, the New World Project Environmental Impact Statement, and the Zortman Mining, Inc., Environmental Impact Statement.

The applicant examined four alternatives and chose the most cost-effective of the four. Several additional alternatives were suggested during review:

1. Using a CAD system rather than a GIS
2. Starting with the PC version of the software
3. Using GRASS, a public domain geographic information system program developed by federal agencies, rather than Arc/Info
4. Networking a PC into the Coal Bureau's work station.

The fourth alternative would involve upgrading the Coal Bureau's software license from a single user license to one that would allow access to the software for up to three users at once. The memory and storage might have to be upgraded. This configuration would be effective if the Coal Bureau's work station would not be overtaxed.

FINANCIAL ASSESSMENT

The costs of DSL's preferred alternative are well documented. However, the preferred alternative may not be the most reasonable, given other alternatives that were not examined. For example, it may be more cost-effective to enlarge the storage capacity and memory of the Coal Bureau's work station, upgrade the Coal Bureau's license to multi-party status, and connect a terminal or PC to the work station, rather than purchase another work station. The $2,000 for travel expenses seems unnecessary since data can be exchanged through the mail. Further, secondary support instead of primary support should suffice, given DSL's existing software and primary support at the Natural Resource Information System. This proposal could also increase long-time personnel costs because RDGP funding is not intended to be a continuous source of funding.

The RDGP budget consists of:

Salaries and wages	$	48,776
Employee benefits	$	12,194
Contracted services (hardware and software maintenance)	$	12,848
Supplies and materials	$	2,000
Communications	$	3,000
Travel	$	2,000
Rent and utilities		-0-
Equipment	$	38,670
TOTAL	$	119,488

ENVIRONMENTAL EVALUATION

No significant adverse environmental impacts are expected. Long-term indirect benefits may occur if use of the GIS system reveals impacts and mitigating measures that would be overlooked using conventional methods of analysis.

PUBLIC BENEFITS ASSESSMENT

DSL has provided little evidence that there is need and urgency for this project, other than stating it has "... increasing inability to review mine applications comprehensively within statutory timeframes." Without some indication of how much this inability is increasing and why, it's difficult to concur that there is an urgent need for this project.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME : Montana State University/PLACES (Precision Land & Climate Evaluation Systems)

PROJECT/ACTIVITY NAME : Soil Moisture Modeling in Reclaimed Landscapes

AMOUNT REQUESTED : $ 96,576

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor	$ 74,321
Western Energy	$ 1,872

TOTAL PROJECT COST : $ 172,769

PROJECT ABSTRACT (Prepared and submitted by applicant)

Criteria for assessing the adequacy of reclamation efforts on strip-mined land require that these areas be returned to a condition having long-term viability, productivity, and diversity of plant communities. Each of these qualities is controlled to a large degree by present and future soil physical and chemical properties. Movement of water through reclaimed landscapes controls the rate and direction of soil profile development, as well as the composition and stability of plant communities present on these sites.

Although current soil replacement practices are seemingly adequate for establishment of cool-season grasses, questions remain concerning their long-term viability and stability. Seasonal and annual patterns of water movement through these strongly layered, reconstructed profiles have not been addressed, despite their critical importance to the future productivity of reclaimed mine soils. It is possible that the currently mandated practice of salvaging and replacing soils in two lifts imposes an unnecessary burden on mining companies while simultaneously resulting in soil profiles that are hydrologically unstable.

The applicant proposes to couple detailed field measurements of vertical and horizontal soil hydraulic properties with landscape-scale simulation of soil water movement using digital terrain modeling techniques at a reconstructed coal mine site near Colstrip. This research will allow the applicant to address questions related to the adequacy of current reclamation practices, as well as to evaluate and validate these techniques for application to additional mined and similarly disturbed sites within Montana. Field monitoring of spatial and temporal changes in soil water status, along with determinations of the transmissive properties of each soil stratum, will be conducted within a fully reconstructed catchment on the Rosebud Mine during two field seasons following project funding. This information will be incorporated into a Geographic Information System-based Digital Terrain Model and used to simulate and predict movement and

accumulation of soil water within the catchment. Knowledge of landscape-scale water distribution will allow inferences to be made concerning long-term development processes relative to soil physical and chemical properties. These in turn may be used to assess probable future plant community compositional and successional trends and the potential success of various management strategies.

The future of coal mining in Montana depends on the ability to ensure successful reclamation. Current uncertainty in appraisal of reclamation adequacy presents a hardship to regulatory agency personnel, as well as economic disincentives for companies wishing to do business in Montana. Products of the proposed research will include both an enhanced understanding of and an improved ability to accurately predict dynamic soil and landform processes that control suitability of reclaimed landscapes for productive management well into the future. These will facilitate application of regulatory practices that are neither unnecessarily restrictive of economic enterprise nor compromising of our land trust responsibilities to current and future citizens of Montana.

TECHNICAL ASSESSMENT (Prepared by DNRC)

The problem is adequately defined and documented in this application from Montana State University's Plant and Soil Science Department. Reviewers saw some value in this area of research and other related hydrologic studies. The necessary permits have been obtained for this project.

One of the applicant's main arguments for the study is that the two-lift soil salvage and replacement now required by reclamation laws may be undesirable or unnecessary. The Montana Department of State Lands (DSL) does not agree with this contention. DSL personnel believe the two-lift method is more desirable than single-lift handling in most circumstances. To some extent the two-lift method maintains the integrity of the organically enriched surface layer(s) and potentially provides for establishment of native plant species from the seed and root stock found in the surface soil horizons. Further, comparing the behavior of soil water in a two-lift soil replacement sequence to its behavior in a single-lift operation appears to be beyond the scope of this proposal.

Although DSL is interested in a digital terrain model of this type, it would like the research to be of a different rationale and focus. The most useful information for DSL would be an analysis of mechanical effects or results of current reclamation practices on soil/spoil physical properties. Such practices include regrading and scarifying spoil surfaces, laying down soil by scrapers, and tilling the replaced soils. DSL reviewers also commented that not all of the study objectives are attainable by this project and budget.

Several other concerns were expressed over the technical design of the project. Technical reviewers questioned the reliability of modeling transport and movement of salts, organics, and other constituents without analyzing existing water quality and soils data. The applicant should identify the field measurements necessary to properly

calibrate and run the model. The relationship between soils and vegetation in this model should be properly addressed by the applicant.

The applicant needs to address how a detailed model of one watershed would be applicable to other watersheds with differing soils and hydrological systems. Modeling this watershed gives no assurance the model will accurately predict moisture behavior, soils development, or reclamation success at another site. DSL recommended the inclusion of additional types of watersheds to be modeled and compared. Reviewers suggested modeling an undisturbed watershed of size comparable to that of the reclaimed watershed in the proposal and modeling a second reclaimed watershed.

FINANCIAL ASSESSMENT

The RDGP budget is shown below:

Salaries and wages	$ 65,940
Employee benefits	$ 15,826
Supplies and materials	$ 2,600
Communications	$ 300
Travel	$ 2,910
Equipment	$ 8,000
Miscellaneous	$ 1,000
TOTAL	$ 96,576

Overall the budget appears to be properly developed, realistic, and adequately documented.

ENVIRONMENTAL EVALUATION

The neutron moisture meter, used to monitor soil water content, does have a low level of radioactive emission. These instruments are used extensively to monitor soil water in research and irrigation water scheduling applications and, if properly used, pose no significant hazard to soil, water, plants, or animals. It should be noted that, according to experts, the significance of this potential impact is small. Overall there appear to be no serious short- or long-term adverse environmental impacts.

PUBLIC BENEFITS ASSESSMENT

The applicant cites more cost-effective reclamation requirements and long-term stability of reclaimed areas as project benefits. These benefits are very uncertain. It appears there is not a great deal of urgency for this project. The proposed project could yield useful information. However, additional research at other sites would most likely be needed before reclamation requirements could be revised. Also, any proposed changes

may need to be field-tested rather than relying solely on the model developed. If the research results are positive and there is additional research, this project could eventually contribute to modification or fine tuning of the reclamation process. This could potentially enhance the certainty of reclamation success, while decreasing the time required before reclamation bond release, resulting in savings to Montana's mining companies. Up to six part-time jobs would be involved in the research for this project.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME : Pondera County Conservation District

PROJECT/ACTIVITY NAME : Lake Francis Shoreline Rehabilitation Project

AMOUNT REQUESTED : $ 300,000

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor	$ 4,500
Pondera Canal and Reservoir Company	$ 4,000
Agricultural Stabilization and Conservation Service (cost share)	$ 1,000
Volunteer Time from Local Community Groups	$ 32,000

TOTAL PROJECT COST : $ 341,500

PROJECT ABSTRACT (Prepared and submitted by applicant)

Severe wave action is eroding the shoreline along the southwestern portion of Lake Francis. This erosion is:

1. Degrading the water quality of the sole source of water for the City of Conrad
2. Destroying the only maintained camping area in Pondera County, which impacts the economy of the City of Valier
3. Destroying the riparian area along the lake, which affects migratory waterfowl and other wildlife species

4. Decreasing the amount of farmland adjacent to the lake by several drill rows a year
5. Dumping tons of sediment into the lake, which is affecting fisheries

With regard to the "Crucial State Need" criterion, Lake Francis is listed in the *1988 Montana Nonpoint Source Pollution Report* as "impaired" due to sedimentation, nutrients, and bacteria with a moderate severity rating. Lake Francis is also identified in the *1990 Montana Water Quality 305b Report* as "impaired" with a moderate severity rating.

The applicant is looking into the possibility of leveraging RDGP monies with 319 and Clean Lake funding sources.

The objectives of the proposal are to:

1. Reduce the impact of the wave action and subsequent erosion
2. Improve the quality of the water provided to people in Conrad
3. Restore lost riparian habitat
4. Restore the integrity of the campground
5. Reduce the adverse effects on fisheries
6. Prevent the loss of additional acres of farmland
7. Increase the useful life of the reservoir
8. Increase public awareness of the importance of water quality

TECHNICAL ASSESSMENT (Prepared by DNRC)

A dike structure has been chosen as the best alternative to protect the campground shoreline. The applicant briefly mentions consideration of other shoreline protection design options for the campground. Including details in the application on the other design options would have been helpful in evaluating whether the dike is the best alternative.

The applicant has not yet chosen final alternatives for the other shoreline areas and is still evaluating a variety of options (riprap, gabions, soil cement, and dikes). Apparently, rock riprap is the currently favored alternative. A detailed cost estimate is provided for the riprap option; however, riprap is not documented in the application as being the most feasible. Researching and comparing the cost-effectiveness of several bank stabilization and protection methods and selecting the preferred alternative for funding consideration would greatly improve the application and facilitate evaluation.

It is recommended that all riprap designs include items 1 through 4 below. Without these modifications, the effectiveness and life span of the riprap in those areas are questionable.

1. Use engineering fabric below the fill/riprap to avoid losing the "fines" as the replacement material becomes saturated by lake water.

2. Excavate the steep banks to provide an adequate slope for placing the riprap and avoid undercutting by wave action.

3. "Key in" the toe of the riprap by placing rock in the soil below the lake level to avoid undercutting by wave action.

4. Place top soil on and reseed the top slope of the riprap to stabilize the top of the riprap material and to make it usable by the public.

A description in the implementation plan of the specific activities to be performed would be helpful in evaluating the plan's effectiveness. It would also give some indication of whether the project can be completed within the proposed time frame.

FINANCIAL ASSESSMENT

A lump sum figure of $300,000 for contracted services is given. The riprap would cost $273,575, and the dike would cost $54,274. The applicant states that costs are based on current SCS and ASCS averages developed for Montana and include labor and materials. The applicant provides adequate documentation as to how the dike and riprap costs were derived. It is doubtful that enough funds are requested to complete the project since the budget does not take into account costs for the four items recommended under the Technical Assessment.

This project may be better suited for funding under EPA Section 314 Clean Lake funds. The applicant should pursue this source of funding.

ENVIRONMENTAL EVALUATION

There would be long-term positive impacts on water quality, soil erosion, and riparian vegetation. The project would have negligible effects on the fishery. There would be short-term impacts of increased sedimentation and turbidity during the construction phase of the project. Also, there would be temporary dust and noise pollution from earth-moving equipment.

PUBLIC BENEFITS ASSESSMENT

The shoreline erosion problem has been traced back to at least 1957, and it has been documented that the erosion rate accelerated in 1979. According to the applicant, if the campground shoreline erosion is not addressed within the next two years, the trees and other riparian vegetation will be lost. In the other areas, the banks continue to erode farther into the shoreline, steepening them and making stabilization more costly.

The applicant cited a variety of public benefits from this project. These would be reduced soil erosion, improved water quality, restored riparian habitat, improved aesthetics, increased recreation values, protection of municipal water supply, and maintained or increased tourism. The Pondera Canal and Reservoir Company and other lakeshore landowners would be the main beneficiaries. This project received a lower ranking because the main beneficiaries would be private entities. Residents in the immediately surrounding area would gain the above benefits, but to much a lesser extent.

The economic benefits were not directly measured. Improvement of the lake may lead to increased recreation values and tourism, but the amount is not quantified and would most likely be very small. Improved water quality would lead to lower costs to treat drinking water--again, the amount of savings is not specified, and other, less costly alternatives may exist.

Several jobs would be provided during the construction phase of the project.

Several public meetings concerning this project were held over the last two years. Generally, there appears to be widespread local support for the project. Documentation of public need and support would be helpful in evaluating this project. Possible methods of documenting public need and support are surveys, questionnaires, community forums, and structured interviews with knowledgeable individuals.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME : Richland County Conservation District

PROJECT/ACTIVITY NAME : Water Development and Management (Neutron Probe)

AMOUNT REQUESTED : $ 48,565

OTHER FUNDING SOURCES AND AMOUNTS : None

TOTAL PROJECT COST : $ 48,565

PROJECT ABSTRACT (Prepared and submitted by applicant)

With much irrigation in this county on the Missouri and Yellowstone rivers, improved irrigation scheduling and methods are needed for both flood- and pivot-irrigated farms. Using the flow meters, surge valve, and neutron probe will maximize crop production, control the rate and amount of timing of irrigation water, and minimize soil erosion and the loss of chemicals and nutrients. Mismanagement of irrigation has caused severe leaching of nutrients and chemicals, erosion of topsoil, unnecessary use of electrical energy, and less than optimum yield of irrigated crops. The use of these projects would control these problems effectively and efficiently.

TECHNICAL ASSESSMENT (Prepared by DNRC)

Through the use of surge valves, neutron probes, and flow meters the Richland County Conservation District proposes to develop and demonstrate methods of improved irrigation, scheduling and efficiency at three locations.

The project's goals are not well defined. The applicant doesn't directly acknowledge that conservation of water is a goal, although this would seem to be an important project benefit. Mention of any past efforts to correct the problems would be helpful.

A variety of solutions to problems addressed by the applicant exist, but there is no discussion of alternative solutions. Alternatives that should be explored include tensiometers or gypsum blocks placed in the soil to directly measure soil moisture. Compared to the neutron probe, this equipment is less expensive, easier to use, and does not require a license to operate. Two computer programs are available that calculate evapotranspiration to determine crop moisture requirements. The simpler program uses ambient air temperature and precipitation; the more complex program uses relative humidity, wind run, solar radiation, precipitation, and ambient air temperature.

To ensure that the project will achieve the stated goals of reducing deep percolation and erosion and increasing irrigation efficiency, more research is needed, and the project

activities must be planned out in detail. . This is critical because, according to technical experts, the equipment described can lead to improved irrigation efficiency. However, poorly planned or inappropriate use of the equipment can decrease efficiency.

Consulting with other agencies in preparation of the proposal would have improved the technical aspects of this project. Also, there are several similar, successful programs in the state that could serve as models for the Richland County Conservation District (CD) program. For example, Musselshell CD and the Flathead Joint Board of Control initiated irrigation management programs last biennium; each received funding from the Water Development Program.

FINANCIAL ASSESSMENT

The project budget is shown below.

Salaries and wages	$ 29,000
Travel	$ 4,350
Equipment	$ 3,815
Miscellaneous	$ 11,400
TOTAL	$ 48,565

Overall the budget is inadequately documented. A more detailed budget would document the validity of the cost estimates, especially for salaries and wages. A cost/benefit analysis would be helpful in evaluating the project. Comparing costs to those of other alternatives would provide information to document that the most cost-efficient alternative was chosen. The applicant is not contributing any funds to this project, nor are there funds from any other sources. This could indicate a lack of public and/or agency support, and possibly a lack of commitment by the project sponsor. It is recognized that many conservation districts have severe funding constraints; to offset this shortage the district could explore the possibility of in-kind service support.

ENVIRONMENTAL EVALUATION

This project poses two potential long-term adverse impacts. One impact is drying up wetlands that might have been produced by overirrigation. An inventory of any wetlands adjacent to the project areas, and an assessment of whether they might be affected by changes in irrigation patterns, would be helpful in determining the extent of this potential impact. The other potential impact is release of radioactive material from neutron probes. It should be noted that, according to technical review, the significance of these potential impacts is small.

PUBLIC BENEFITS ASSESSMENT

The irrigators participating in this project will be the direct economic beneficiaries. However, the number of irrigators who will be assisted in unclear. The applicant should plan to assist as many irrigators as possible.

To a much lesser extent than the individual irrigators, local and statewide public benefits will be gained through reduced erosion, improved water and energy conservation, and decreased water contamination.

Benefits appear to be gained only during the term of the project, which is three years. Once the RDGP funding runs out, the project sponsor will need to find another source of funds. The number of jobs created by this project will be negligible.

More technical data to support the need for and urgency of the proposal would be helpful to the applicant's cause. An assessment of public support would also strengthen this project. Interviews with local landowners would be valuable, as well as public meetings, surveys, and questionnaires.

A plan to disseminate the results of this project on a county-wide (or larger) basis would add to this project. Some effective methods to get the information out to the public would be news releases, field days, seminars, county fairs and other booth displays, direct mail, and public service announcements.

RECOMMENDATION

No funding is recommended for this project.

APPLICANT NAME : Sheridan County Conservation District

PROJECT/ACTIVITY NAME : Extent of Oil Field Waste Contamination in Lakes and Aquifers in Eastern Sheridan County

AMOUNT REQUESTED : $ 251,730

OTHER FUNDING SOURCES AND AMOUNTS :

Project Sponsor	$ 5,700
Montana Bureau of Mines and Geology	$ 75,370
Sheridan County	$ 5,000
Soil Conservation Service	$ 3,200
	$ 89,270

TOTAL PROJECT COST : $ 341,000

PROJECT ABSTRACT (Prepared and submitted by applicant)

The quality of surface water and groundwater resources in many parts of eastern Sheridan County has been degraded by discharges of oil field wastes (Reiten and Tischmak, in press). Documented impacts include degraded water quality in supplies of domestic water, stock water, irrigation water, lakes, and wetlands. Additional impacts to water resources will likely occur, based on the proximity of these resources to sites of oil field waste discharges. The extent of existing impacts and potential extent of future impacts to resources have not yet been determined. The hydrogeologically complex physical setting typically found in the glaciated terrain of this region makes identifying the extent and magnitude of brine plumes difficult.

Environmentally unsound methods of brine disposal that were commonly used prior to 1975 are the main causes of the existing impacts. The main sources of contamination are infiltrations of highly concentrated sodium chloride brines from abandoned evaporation pits, reserve pits, injection wells, and brine collection facilities. In addition to increased sodium chloride concentration, the concentrations of many other common dissolved minerals are typically increased as a result of brine contamination. In many documented cases, water supplies have been damaged beyond usability. While many of these impacts are actually related to site-specific discharges, the extent, diversity, and large number of discharge sites create a nonpoint-source effect.

The large number of oil field sites precludes a detailed investigation of every problem area. This project will define impacts at three specific sites and produce results transferrable to other areas by defining brine plumes in detail (1) within the largest area of existing contamination (Goose Lake Field brine plume); (2) near the most significant water resource potentially impacted (Clear Lake aquifer); and (3) within the most

complicated flow systems (glacier till settings). The results will be an integral part of mitigation plans for cleanup and protection of other potentially impacted resources. This information will help current water users determine if their water supplies are in jeopardy of being degraded. In addition, future water users will be able to assess the quality of water resources prior to investing in development.

The project area will include about nine townships in eastern Sheridan County. The scale of these investigations will be variable, depending on the specific component involved. The Goose Lake brine plume component (1) is anticipated to cover several sections, the Clear Lake aquifer component (2) will cover several townships, and the glacial till component (3) is anticipated to cover less than one section. The project will take about two years to complete.

Study methods will be state-of-the-art and include electromagnetic surveys to define the geometry of the plumes, followed by test drilling, water level monitoring, and water quality monitoring to verify the shape and concentration of the brine plumes. The proposed study methods have been tested and applied to similar settings by the Montana Bureau of Mines and Geology (MBMG).

TECHNICAL ASSESSMENT (Prepared by DNRC)

Considerable RDGP funding has been expended in Sheridan County investigating adverse hydrogeological impacts caused by reserve pits and improper oil field brine disposal methods. To DNRC's knowledge, these study efforts have yet to result in actual cleanup of identified problem areas.

The 1987 Montana Legislature approved a $100,000 RDGP grant to Sheridan County for the purpose of determining the extent of surface water and groundwater contamination from oil field activity in selected areas of Sheridan County. Carried out by the Montana Bureau of Mines and Geology, this study involved detailed hydrogeological investigation of a severely contaminated area near the Goose Lake Oil Field. Significantly, conclusions regarding the extent of contamination, its source(s), and methods to lessen or correct the contamination problem were major study findings. This study was completed in April 1991. The current proposal does not suggest implementing any of the recommended corrective options, which is a major shortcoming.

Although further study of the oil field waste problem may prove useful in certain circumstances, without commitment to cleanup, it could become an academic exercise. The prudent course would seem to be to wait and see if cleanup measures are implemented based on the results of the 1987 RDGP study and examine the effectiveness of those measures. Then a proposal could be submitted containing both follow-up study and cleanup elements. The applicant should also pursue the possibility of the Board of Oil and Gas Conservation's adding problem sites to its targeted listing of sites scheduled for cleanup (funded by RDGP funds).

FINANCIAL ASSESSMENT

This proposal is similar to one submitted in 1990 when $134,736 was requested. The total project budget this year is estimated to be $341,000 for the two-year duration of the project, including $251,730 in requested RDGP grant funds and $89,270 in matching funds and in-kind services. Sources of matching funds include the project sponsor, Sheridan County, Montana Bureau of Mines and Geology, and U.S. Soil Conservation Service.

The RDGP budget is broken down as follows:

Salaries and benefits	$ 107,230
Contracted services	$ 85,250
Supplies and materials	$ 12,150
Communications	$ 2,000
Travel	$ 29,000
Equipment	$ 15,500
Miscellaneous	$ 600
TOTAL	$ 251,730

Costs appear reasonable, but documentation of the number of wells to be drilled and the number of water quality analyses to be conducted is lacking. However, it appears that enough funds are requested to do this phase of the job. More money would be required for cleanup.

ENVIRONMENTAL EVALUATION

The project would not be likely to result in any major adverse environmental impact, assuming proper care is taken in drilling and completing the test wells. Some soil compaction may occur at well sites, depending on soil type and moisture conditions. Wells would have to be abandoned properly at the end of the study to prevent further contamination of deep aquifers. Long-term, indirect beneficial effects could occur if the knowledge gained from this study is used to complete a future cleanup.

PUBLIC BENEFITS ASSESSMENT

The primary benefit from this study would be the knowledge gained. If the plan derived from this study is used to clean up contaminated surface water and groundwater, the benefits would be significant. However, there is no assurance that the results of the study would be acted upon. Consequently, little may result from this study other than a better understanding of the extent of contamination.

RECOMMENDATION

No funding is recommended for this project.

ABBREVIATIONS

AMD	acid mine drainage
ARCO	Atlantic Richfield Company
ASCS	Agricultural Stabilization and Conservation Service, U.S. Department of Agriculture
BLM	Bureau of Land Management, U.S. Department of the Interior
BMP	best management practice
BOGC	Montana Board of Oil and Gas Conservation
BWQA	Bullhead Water Quality Association
CD	conservation district
CDB	Conservation Districts Bureau, Montana Department of Natural Resources and Conservation
Co.	county
DFWP	Montana Department of Fish, Wildlife and Parks
DHES	Montana Department of Health and Environmental Sciences
DNRC	Montana Department of Natural Resources and Conservation
DSL	Montana Department of State Lands
EA	environmental assessment
EPA	U.S. Environmental Protection Agency
FTE	full-time employee
GIS	Geographic Information System
GPD	gallons per day
gpm	gallons per minute
LIS	Land Information System
MBMG	Montana Bureau of Mines and Geology
MCA	*Montana Code Annotated*
MDOA	Montana Department of Agriculture
MEIC	Montana Environmental Information Center
Montana Tech	Montana College of Mineral Science and Technology
MSCA	Montana Salinity Control Association
MSU	Montana State University
NIDR	National Institute of Dispute Resolution
NPS	nonpoint source
NPSP	nonpoint source pollution
OSM	Office of Surface Mining, U.S. Department of the Interior
PMC	Plant Materials Center
ppm	parts per million
PRP	potential responsible party
RC&D	Resource Conservation and Development [Area]
RDGP	Reclamation and Development Grants Program
RIT	Resource Indemnity Trust
RITF	Resource Indemnity Trust Fund
RRU	Reclamation Research Unit
SCS	Soil Conservation Service, U.S. Department of Agriculture
USBM	Bureau of Mines, U.S. Department of the Interior
USBR	Bureau of Reclamation, U.S. Department of the Interior
USDA	U.S. Department of Agriculture
USFS	Forest Service, U.S. Department of Agriculture
USGS	Geological Survey, U.S. Department of the Interior
WASTEC	Water, Air, and Soils Testing and Evaluation Center
WGA	Western Governors' Association
WQA	Water Quality Act
WSCT	westslope cutthroat

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